Restricted

RCEME TECHNICAL BULLETIN

Directorate of Electrical and Mechanical Engineering

Volume 7, Number 2 April 1962

RCEME
TECHNICAL BULLETIN

CONTENTS

Anti-Tank Guided Missiles	3
Diversified Activities 56 Inf Wksp	7
Inspector RCEME Visits Quecom Militia	10
Le 25e Escadron Technique d'Arvida	11
Production of SEVs in RCEME Base Workshops	13
In Retrospect - Capt LG Rupert MC	22
Training Notes	24
Try This Training Test	26
Balancing Manpower and Workloads	27
Workshop Control Procedure	28
Where Are We Going?	29
Personal Capacities for Management	31
Militia Radiac Instructors Course	32
Job Satisfaction	33
Going Home	34
Manitoba Area RCEME Bonspiel	36
Letters to the Bulletin	37
Who's Where Warrant Officers	38

COVER: Our cover shows Col CW Jones, CD, CO 202 Base Workshop, presenting Suggestion Award to S sgt HR Jones. See page 2.

SUGGESTION AWARD

S sgt HR Jones was presented an award for his suggestion regarding the use of a flycutter instead of a grinding wheel for refinishing Meteor engine heads and skirts. The presentation of a cheque for $80 and a certificate was made by Col CW Jones, CD, CO 202 Base Workshop RCEME, on 10 Apr 62 on behalf of the DND Suggestion Award Committee.

S sgt Jones, a vehicle artificer, is employed as a supervisor on the engine rebuild line at 202 Base Workshop RCEME. He proposed a more efficient method of finishing the surface of Meteor engine heads and skirts. The method was previously done by using a large grinding stone mounted on a Lempco surface grinder. S sgt Jones investigated the use of a number of small cutters to do the job, rather than grinding which was a slow process.

This new method has been used with good results. A recent question was raised that the maintenance on the flycutter might be greater than a grinding wheel. An investigation proved that just the reverse was true.

EDITORIAL

We are indebted to WO1 WG Robertson for our cover picture. Actually, though, all Bill did was take the trouble to cut the picture out of the Montreal Gazette and bring it in to us, with the remark, "Here's something might be of interest to you." It was, in fact, just what we were waiting for.

The point we're trying to make is this. On April 19th we did not have a suitable cover picture for the April Bulletin. Nor did Army Public Relations at AHQ have a suitable picture. The only picture of Corps activities we had was one of the Manarea bonspiel - hardly suitable for our cover. (See page 36).

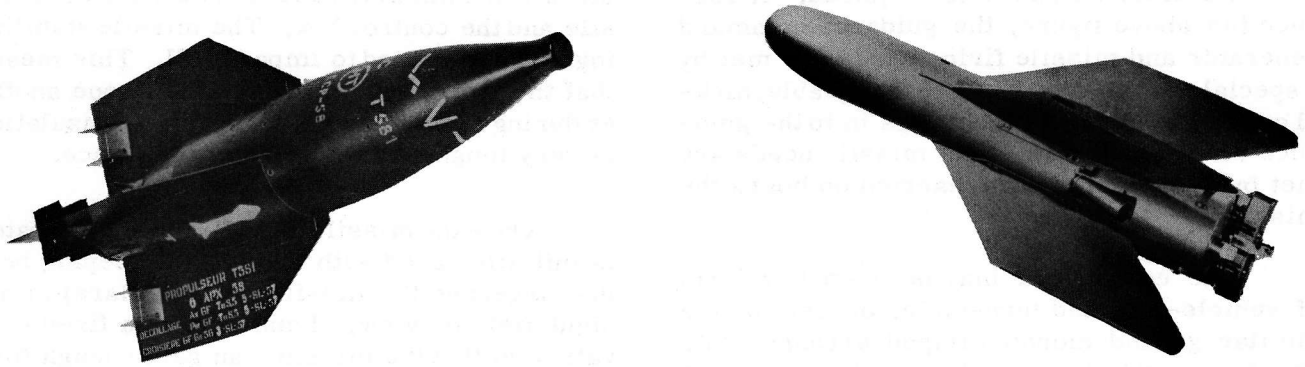
Why not alert someone in your unit to keep us supplied with pictures of RCEME, as well as with stories, of a technical nature.

NOTES ON DRESS

The following is an extract from Orders and Instructions for Dress of the Canadian Army, paragraph 2.04 (2).

"With mess dress and evening dress, one neck badge and miniatures of all orders, decorations and medals will be worn. Miniatures of orders, decorations and medals will not be worn on dinner jackets."

ANTI-TANK GUIDED MISSILES



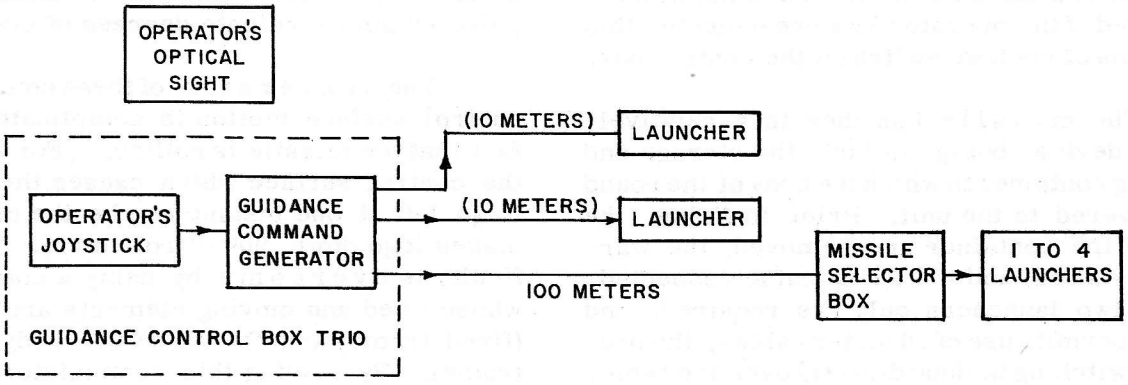
By Maj WR Willing

ANTI-TANK GUIDED MISSILES

During 1963 armoured and infantry units will acquire two types of wire-guided anti-tank missile systems. At this time these are known as the SS-11 and the ENTAC.

Since both systems are members of the same family (of French origin) they are functionally very similar. Operator-training on both, for example, will be accomplished on the same simulator, an optical/electrical device which realistically creates the impression of a missile being guided to a selected target.

There are two types of simulator, the DX-43 intended for field use, and the DX-44 which is more suited to the class-room.



Basic Components of ENTAC System

DESCRIPTION OF ENTAC

The simplest complete ENTAC weapon consists of an operator's sight (issue binoculars), which are clamped to a post on the guidance control box, and one launcher connected to the control box by a 10 meter cable.

No external power is required. Reference the above figure, the guidance command generator and missile firing needs are met by a special sealed type, 12 v, rechargeable, nickel cadmium battery, which plugs in to the guidance control box. In-flight missile needs are met by a special battery carried on board the missile.

The control box may be fixed to a form of vehicle-mounted turn-table, or set up on a similar ground-mounted tripod arrangement. The firer sights the target through the binoculars and releases missiles by switches on the control box. These are fired one at a time. Before a missile leaves a launcher, a simple firing sequence occurs within the missile itself:

a. An explosive charge forces electrolyte from a previously sealed container into the missile battery.

b. Gasses from a second explosive charge 'wind up' a turbine coupled to a gyroscope rotor.

c. Battery power from the control box fires the igniter for the main rocket motor. At the same time, a flare on the aft end of the missile is ignited if the operator has pre-selected this by means of another switch on the control box.

The missile launcher is a relatively simple device, being, in fact, the storage and shipping container in which the body of the round is delivered to the unit. Prior to firing, the ends of the container are removed, the warhead installed, and the firing cable connected. Where two launchers only are required, and ground permits use of 10 meter cables, the prefiring switching is done directly over the cable. Where the 100 meter cable is required a missile selector box is coupled between the control box and the launcher (see figure above). In all cases, the launcher to be fired is selected by the operator at the control box.

The missile contains two spools of fine insulated wire designed to permit rapid spewing. One end of each wire is permanently attached to the launcher, so that an electrical circuit is maintained in flight between the missile and the control box. The missile stabilizing fins are canted to impart roll. This means that the control wires are twisted on one another during flight; however, since wire insulation is very tough, this is of no consequence.

Once the missile is in flight, the operator is initially faced with the task of keeping both the target and the missile (missile flare) in his sight field of view. Launch is at a fixed elevation so that the missile can gain enough forward velocity to develop the required lift, ensuring that it does not plough into the ground early in flight. Thereafter, direction in yaw and pitch falls to the will of the operator who uses a simple joystick to bring the missile to bear on the target.

Joystick motion controls the position of the rotors of four potentiometers which set DC potentials on elements of the guidance command generator. The latter is a transistorized, printed circuit board arrangement which converts the DC control signals to a special form of AC signal. The AC signal to the missile is a composite, making use of polarity to distinguish between pitch and yaw commands, and pulse length to indicate degrees of command.

The conversion of these commands to control surface motion is complicated by the fact that the missile is rolling. (For example, the control surface which causes the missile to go left at one instant can be the one which makes it go down, 90° of roll later). This difficulty is overcome by using a commutator whose fixed and moving elements are the gyro (fixed frame) and the missile body (moving frame). By placing this commutator electrically between the command wires and the control surface activators, any specific command,

say, "hard left", is interpreted as a cyclic operation of all control surfaces in exact synchronism with missile roll, and in such a way that the net effect is to steer it hard left.

DESCRIPTION OF SS-11

This system is most readily described by noting differences from the ENTAC system.

The operator's sight to be used by the Canadian Army has not yet been decided. Two fields of view may be provided.

The missile is heavier and does not roll in flight. A gyro is still required on board; however, this is 'wound up' by a wire anchored to the launcher. When the missile leaves the launcher, the wire is 'pulled' in the fashion of a string on a toy gyroscope.

Missile batteries are special, not chargeable, subject to limitations of shelf life (greater at lower temperatures) and a battery tester is required at the user unit.

Missile flares are removable.

The guidance control box is known as the T10K. It has a capability for self-test but the guidance command generator (called the 'coder') is a sealed unit stated to be non-repairable. A remote joystick can be employed.

Guidance control box power originates in a self-contained 24 v, nickel cadmium, chargeable battery. This is not the same type as used with ENTAC.

Selection of the missile to be fired is made by an operator at the missile selector box.

The launcher is available in several types. Only the horizontal-mount version will be supplied. This secures the missile by a special latch, which is released, before launch, by an explosive cartridge. (The latter must also be removed for maintenance tests). A second launcher cartridge may be used to jettison control wires on completion of each engagement.

REPAIR IMPLICATIONS

Interconnecting Cables (both systems)

Potted or molded connectors are not used. ENTAC cable conductors are soldered to the connector pins. SS-11 cable conductors are crimp-connected. All connectors are peculiar to Europe, and special crimping tools will be needed.

HARDWARE (both systems)

All hardware is International metric thread.

ENTAC Missile

From a repair and maintenance standpoint, the ENTAC missile is as close to being a conventional round of ammunition as any other known guided missile. As mentioned above, a gyro is used as a spatial reference and a battery is required for motivating directional control surfaces. Since both of these items are energized by pyrotechnics they can only be tested once - when the missile is fired.

Under certain conditions of poor visibility the flare at the aft end of the missile is required. Pre-fire testing could reveal a faulty flare; however the possibility of this failure is so remote that the flare is permanently installed by the manufacturer and cannot be substituted.

For the above reasons, there will be no RCEME repair of the ENTAC missile. Periodically, and on receipt and issue, RCOC will carry out surveillance of ammunition stocks, using a special test set. The latter is electrical in nature and is designed to measure the resistance and continuity of missile circuits. The disposal of rounds demonstrated to be non-serviceable by this means, will be by demolition.

SS-11 B1 Missile

This round is in the same category as the ENTAC round. Testing of the gyro is not possible, missile flares will not be changed by the

user and will not be tested except by RCOC on a surveillance-of-stocks basis.

Missile batteries are the only item requiring attention after issue, and a special battery tester will be provided for this purpose.

Periodically, and on receipt and issue, RCOC will carry out surveillance of ammunition stocks using a special test set. The latter is similar to that provided for ENTAC. The disposal of rounds demonstrated to be non-serviceable by this means will also be by demolition.

Organizational Employment

The majority of ENTAC systems will be found in the Support Company of the Infantry Battalion. Both SS-11 and ENTAC will be found in the Armoured Reconnaissance Squadron, and SS-11 only, in Tank Squadrons of the Armoured Regiment.

The DX-43 Simulator will also be employed in field units.

Adapter Kits will be developed for the Truck Utility 1/4 ton, Truck Cargo 3/4 ton, Ferret and the Centurion.

RCEME Repair

Support plans are now being prepared. Tasks at the unit will consist largely of battery charging, battery condition assessment and the repair of faulty cables. As already mentioned, there will be no missile repair. The field workshop will be provided with a mobile repair facility common to the two guidance systems and the simulator.

Major support forward will be effected by substitution of major items. Actual repair of such items will be carried out by the workshop organization.

SO YOU HAVE A PROBLEM!

Ask these questions of the man 'who watches you shave'.

1. What really is my problem?
2. Are my facts accurate and complete?
3. Am I making false assumptions?
4. Have I considered all alternatives?
5. Who, when, where, which, what, how and particularly why?
6. What are the effects of the various solutions to my problem?
7. Have I time to sleep on it?

Perhaps the next time you see your friend you will be much nearer to your answer. Remember, very seldom is no answer a good one, but frequently any answer is better than none.

Give your friend time to help you. He can be more objective than you and as a consultant his fee is quite low.

A few hours browsing through a book called "The Art of Problem Solving" by Hodnett can be very helpful.

DIVERSIFIED ACTIVITIES OF 56 CANADIAN INFANTRY WORKSHOP RCEME

By Capt WH Norton

To the uninitiated the Middle East remains a foreign place of mystery but to RCEME personnel serving there at present with the 56 Canadian Infantry Workshop their daily lot appears to be somewhat different to RCEME personnel serving in more conventional locations.

Major J Clarabut, the present Commanding Officer of the workshop, reports that in addition to normal RCEME maintenance tasks, his unit is often called on to provide somewhat unusual services.

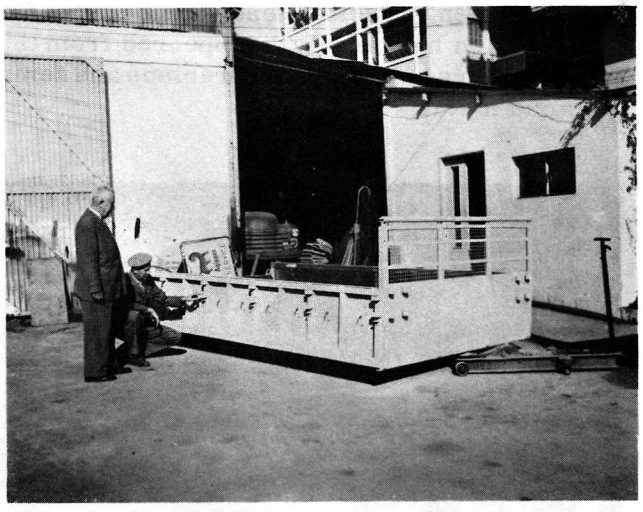
One of the activities of the UNEF in which RCEME personnel are involved is the procurement of new and specialized vehicles. These include buses, refrigerator vans, water and petrol tankers, sanitary vehicles and even troop and cargo carriers. Normal procurement of vehicles in Canada is a fairly simple process but this is not so with the UNEF.

The trucks originally supplied by the national contingents of 1956-57 are now largely worn out. To replace them from the original countries would be uneconomical and in many cases it would involve unnecessary capital and transportation costs. A more satisfactory arrangement is the purchase of a standard series of chassis for shipment to Middle East ports and the building and mounting of the required special bodies by local manufacturers. In some cases it is estimated that the overall cost is reduced by as much as two-thirds.

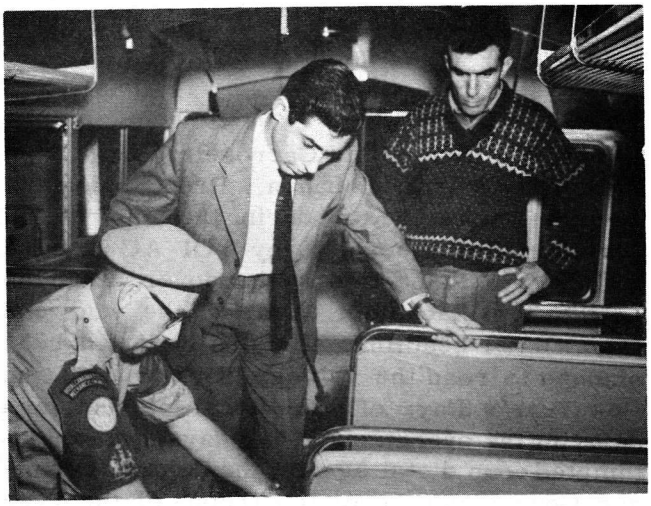
When vehicle bodies are being produced under local contract arrangements, RCEME is called on to assist in the preparation of vehicle specifications, and also act as advisers to the staff in the review of the technical aspects of requesting and selecting contractors' bids. When contracts are let RCEME then acts as the inspection agency for UNEF.

Two new 32-passenger buses were recently completed under local contract arrangements by a firm called Carroseirie Aabilliana located in Beirut, Lebanon. Progression inspection was carried out during the construction period in December 1961 by WO1 AC Brunton and the final inspection and handover was made on the 30th December to meet the year-end financial deadline. Originally it had been planned to road the vehicles back to Egypt on New Year's Day; of some local interest, and delaying the operation for two days, was an attempted coup d'etat against the Central Lebanese Government involving troops of the Tyre Garrison which is located on the proposed homeward route.

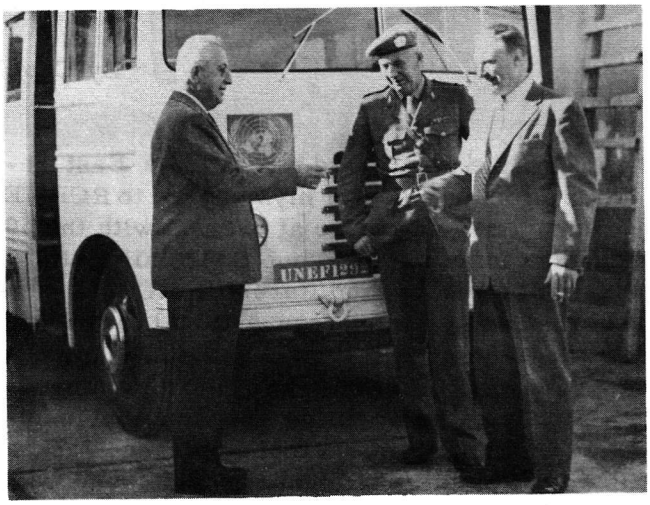
Delivery of the completed buses together with accumulated stores held in Beirut was made to the Ordnance Company in Rafah on the 3rd of January 1962. During the ten hour trip down the eastern Mediterranean shore, and covering the entire coast line of the state of Israel, the equipment was road tested by workshop personnel.



WO1 AC Brunton and the contractor examining a heavy cargo box.



WO1 A C Brunton checking interior body fittings with Mr N Abillana, a mechanical engineering product of the French University, Beirut.

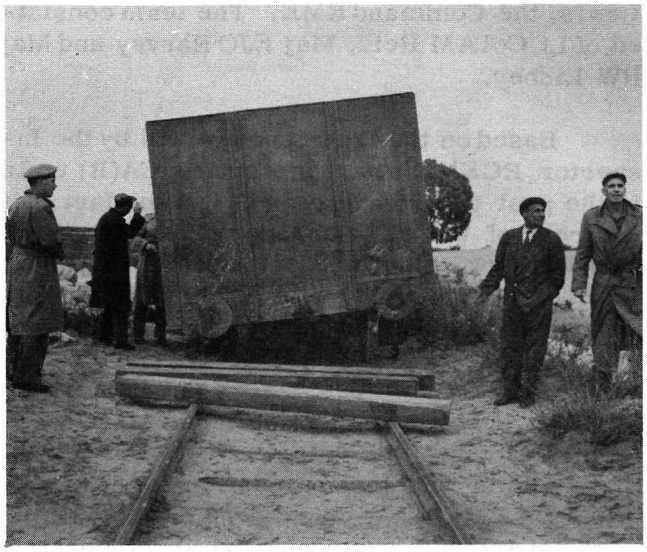


Mr J Abillana, general contractor, passes vehicle keys to Mr Peiter Evero, UN Procurement Officer, Beirut.

Local craftsmen at work. All body components not imported as standard items, are hand made in sheet steel or molded in fibre glass; this includes the front and rear domes and safety doors which in this case were hand shaped in mild steel. These tradesmen are becoming scarce in Beirut and are therefore the highest paid workmen. Their talents can be traced to a craft which has largely disappeared from this area - beaters of items from precious and semi-precious metal.

The New and the Old. New buses and Pepsi-Cola approved automotive safety campaign posters are located in front of the 2000 year old Roman colonade from Baalbeck which is now situated in front of the Lebanese National Museum in Beirut. The museum is located a very short distance from the city workshop and office of the contractor.

UNUSUAL RECOVERY TASK

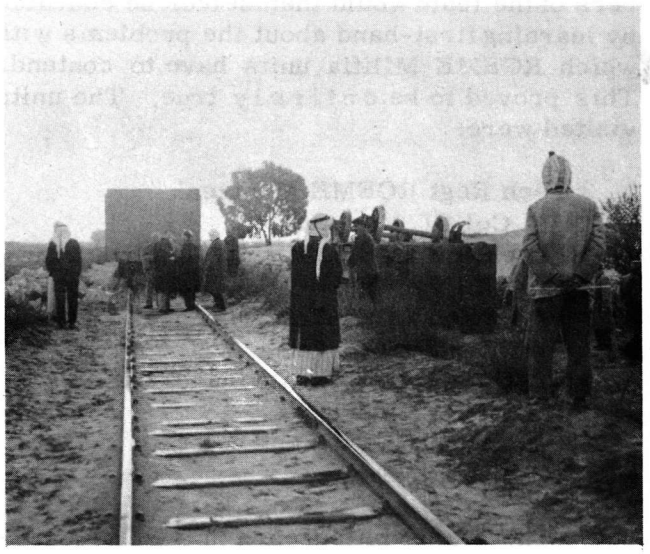


Camp Rafah (the camp in which the workshop is located) is on a railroad line running from Gaza to Cairo.

Recently the workshop was requested by local railroad authorities to carry out an unusual recovery task when a flat car was derailed by a broken wheel housing. The scene of the derailment was about three miles from Camp Rafah.

The derailed flat car was holding up railway traffic and had to be removed from the tracks as soon as possible. A crew with a three-ton wrecker was despatched to the scene.

The situation was quickly sized up by Capt Don Maher who was in charge of the recovery operation. A winch cable was fixed to the flat car, and the wrecker winched the car off the tracks. The flat car was now on its back like a stranded turtle, and clear of the right of way. The railway was once more in business.



This is the second time that the workshop has been requested to haul railway cars off the tracks. As one craftsman said: "Unusual tasks of this nature are all in a day's work and makes the time go faster".

INSPECTOR RCEME VISITS QUEBEC COMMAND MILITIA UNITS

By Maj RW Libbey CD

During the period 13 to 22 March 1962 the Inspector RCEME team from DEME visited the RCEME Militia units in Quebec Command. The team was accompanied by Lt Col AHR Lewis, the Command EME. The team consisted of Lt Col AM Reid, Maj EJO Harvey and Maj RW Libbey.

Based on the experience gained by the Inspector RCEME while inspecting CA(R) units in the past two years and also on the fact that the role of the Militia had changed to one of national survival, it was decided that Inspector RCEME should visit a number of Militia units on a trial basis. The aim of the visit was to examine

a. organization and establishments,
b. training,
c. tooling and accommodation.

Apart from examining the above possible problem areas it was considered that the members of the team would themselves be educated by learning first-hand about the problems with which RCEME Militia units have to contend. This proved to be entirely true. The units visited were:

2 Tech Regt RCEME Montreal
Lt Col GL Marotte
22 Tech Sqn RCEME Cap de la Madeleine
Maj JB Pierce
24 Tech Sqn RCEME Sherbrooke
Maj RB Sweet
25 Tech Sqn RCEME Arvida
Maj JGC Simard
42 Tech Sqn RCEME Quebec City
Capt B Rondeau

The team visited each unit while an organized training program was being carried out. In all cases members of the team were both surprised and pleased at the high level of morale and enthusiasm shown by both officers and men of the units. Members of the team discussed numerous problems with unit officers and NCOs and succeeded in answering most of the queries.

The team discussed the implications of new proposed establishments for technical regiments and technical squadrons and at the same time discussed the newly authorized RCEME (M) trade specifications. The scale of tooling required to properly conduct training in accordance with the specifications was also reviewed. Unit personnel contributed many good comments which are now being included in the various documents. All the unit commanding officers agreed that the sooner the entire new program could be authorized, the better it would be for them.

One of the many highlights of the tour was the celebration by 25 Technical Squadron of its 10th anniversary. There was a parade of all squadron personnel including the local cadet corps, all of whom wear RCEME insignia, and the cadet corps drum and bugle band. An article published in the local newspaper in Arvida about the 10th anniversary ceremonies is reproduced elsewhere in this issue of the Technical Bulletin. Following the parade and inspection the team was taken on a brief conducted tour of the Shipshaw Dam and later attended a very pleasant mess dinner at the Saguenay Inn.

These visits proved to be well worth-while and may be extended in the future to other Commands.

Le 25e ESCADRON TECHNIQUE D'ARVIDA

fête son 10e anniversaire

Le 25e Escadron technique (milice) des Services de l'électricité et de la mécanique (RCEME), d'Arvida, LA SEULE UNITE DE MILICE AU CANADA A DEPASSER SES EFFECTIFS, fêtera samedi prochain son 10e anniversaire de formation. L'actuel commandant est le major Clément Simard, CD, ingénieur au contrôle de l'usine de réduction No 4 de l'Alcan d'Arvida.

Ce dixième anniversaire sera donc fêté le samedi 17. L'unité assistera a la messe en l'église Saint-Jacques, a 10h. Des hauts dignitaires de l'Armée inspecteront l'unité a 2 h. 30 de l'après-midi.

La soirée débutera par un "dîner de mess" et se terminera par une soiree dans les huttes de guerre qui servent encore de manège au "25e Tech."

HISTORIQUE

La formation officielle du 25e Escadron technique date du 27 mars 1952 et ce n'est que le 27 octobre de la même année que l'on publiait les premiers ordres du jour de l'unité.

Le Major WB Moore fut le premier commandant de cette unité de milice qui comptant déjà 19 membres au bout de deux mois, dont les tout premiers à se joindre, les caporaux Lazarre Bélanger et Jim McLeod, tous deux employés des usines de l'Alcan d'Arvida sont encore très actifs.

En 1954, le capitaine OS Gislason prenait le commandement de l'unité et portait ses effectifs a 87 membres. Le lieutenant J Dupuis devenait commandant en 1955, et lors de son départ pour la Guyane anglaise, cédait le commandement au Major Clément Simard, CD, en janvier 1956.

Depuis la formation de cette unité de milice, jusqu'a la fin de 1961, 608 personnes se sont jointes au 25e Escadron technique dont 369 ont démissionné, soit pour faire partie des forces régulières, (environ 80) ou pour d'autres raisons.

A la fin de 1961, l'unité comptait 239 officiers, sous-officiers et artisans, soit 50 de plus que son effectif autorisé. Arvida doit s'enorgueillir d'avoir une unité de milice aussi active.

Questionné sur la raison de ce succès, le commandant Simard nous déclarait que: "Si le 25e Escadron a si bien réussi et en si peu de temps, malgré l'exiguité lamentable de ses locaux, il le doit a ses officiers et sous-officiers, qui n'ont jamais compté leur temps quand il s'agissait de suivre des cours de perfectionnement pour mieux entrainer les nouvelles recrues". Le commandant Simard ajoutait aussi qu'une part de ce succès revenait aux populations d'Arvida, Jonquière et Kénogami, qui ne craignent pas de se joindre à l'unité ou d'autoriser leurs jeunes à le faire, pour y prenre un peu de discipline et des notions utiles de métiers.

COURS DE METIERS

Malgré que l'entrainement soit maintenant orienté vers la Survivance nationale, l'armée a tout de meme besoin d'hommes de métiers. Le "25e Tech" donne cette année des cours de mécaniciens et d'électriciens en automobile; de mécaniciens de radiac, de soudeurs, de chauffeurs-mécaniciens, de spécialistes en dépannage. Plusieurs de ces cours sont encore donnés a l'Institut de technologie d'Arvida et payés par l'Armée.

D'autres cours de métiers se donnent aussi à l'unité lorsqu'on peut y trouver assez de place pour l'équipement et pour y donner les cours.

CAMPS D'ETE

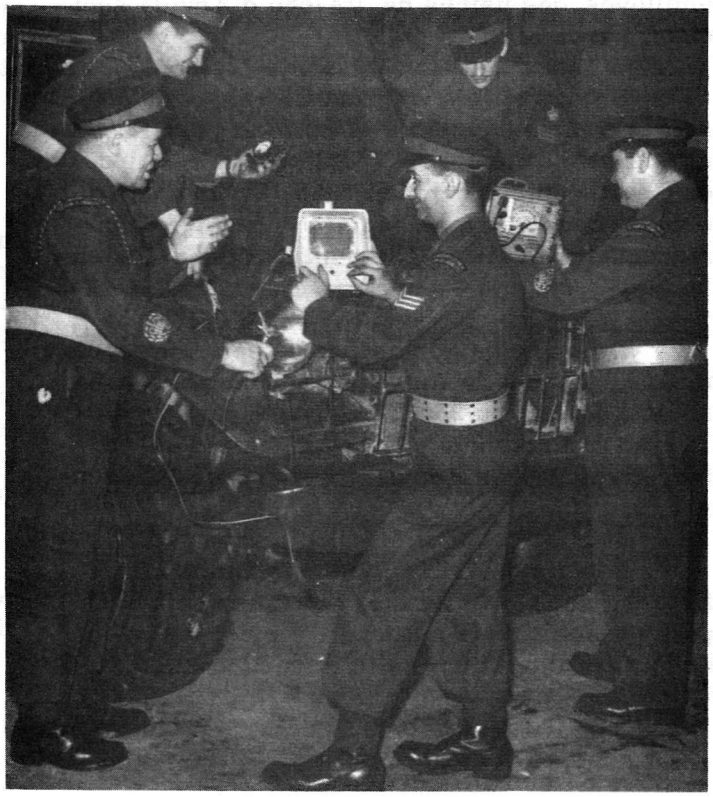
Chaque année, un certain nombre de miliciens se rendent au camp d'été. En 1957, le camp d'été avait attiré 66 personnes et ce nombre a grandi pour s'élever a 134 l'an dernier.

Parmi les 67 officiers, sous-officiers et artisans qui étaient au 25e Escadron en 1956, les 14 personnes suivantes y sont encore: des usines d'Arvida; les caporaux L Bélanger, JH McLeod et A Poirier; le sergent L Boissonneau, le sergent d'état-major A Dion; les WO2 GB Tremblay, O Gagné et HP Côté; le lance-caporal R Jean et le major Simard.

Les sergents d'état-major R Fortin, (facteur), G Fordon, (Bell Telephone), et V Blackburn, (instructeur aux cours spéciaux de la milice) de meme que le caporal L Mathieu, (aussi instructeur), font aussi partie du groupe des anciens qui sont encore a l'unité.

Des usines de l'Alcan d'Arvida, les sergents G Nadeau, les WO2 Boudreault, et G Foster, le sergent d'état-major JP Pedneault et les caporaux L Potvin, OR Lavoie et JB Chiasson, de même que le capitaine DS Melanson se sont joints a l'unité avant mai 1956.

Left to right:
Mr PE Cardinal,
Instructor at L'Institut
Technologique d'Arvida
Cfn M Poulin
Cfn JC Tremblay
L/Cpl JPG Girard
Cfn R Cyr
Cfn Y Dubois



WO2 O Gagne
WO2 G Foster
Sgt L Mathieu
S sgt JP Pednault
WO2 HP Cote

PRODUCTION OF SPECIALLY EQUIPPED VEHICLES IN RCEME BASE WORKSHOPS

By Sgt LW Phipps CD

Mobile shop equipments and facilities are essential if RCEME field units are to perform their missions: training themselves, supporting other arms and services during exercises, and being available to provide mobile repair support and operations when required.

The mobile shops are provided on establishment as "Specially Equipped Vehicles" (SEV). These are no more nor less than Standard Military Pattern Vehicles into which essential workshop tooling and equipment is fitted, ready for use.

RCEME field units held a number of wartime Canadian Military Pattern Vehicles fitted for special purpose, but these had many drawbacks. They were old and unreliable, and replacement parts were hard to obtain. They were mostly right-hand drive, therefore difficult and potentially dangerous to drive. The fitted equipment was old and often incomplete. The electrical test equipment was 6 volt, whereas the requirement was for 12 and 24 volt and this equipment was often carried loose and subject to damage in transit.

Holdings, deficiencies, and requirements were reviewed and priorities of the required SEVs determined. A meeting was held to establish a definite procedure by which the policy for carrying out the production of SEVs could be regulated.

A review was made of Base Workshop tooling, manpower, and the allocation of SEV production abilities determined.

Authority was requested for the production of these RCEME SEVs. To reduce costs it was proposed to produce austerity versions; items of equipment not absolutely essential would be eliminated, and the restricted year-round usefulness of the equipment accepted.

Additional out-of-pocket expenses would be confined to expendable stores and material. It was decided to permit the flexing of the current design to allow maximum use of stocks held by RCOC.

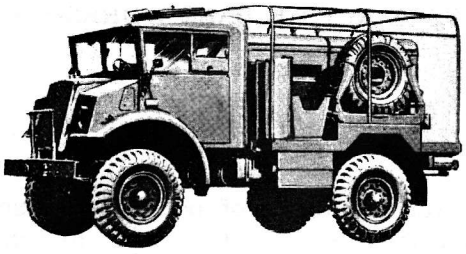
The completion of this program would enable the following CMP vehicles to be disposed of: 15 cwt KL, Mach M, F, I, DI, and Instrument Repair.

The new family of SEVs based on SMP vehicles would be complete, with four exceptions. The Battery Charging Adapter Kit and the Optical and Instrument Repair Shop Kit were both under development. The General Office Van and the Trailer Mounted 10 kw Generator were both deferred.

On completion of the program the progressive procurement of the balance of the tools and equipment necessary to bring the SEVs up to full scale would be undertaken. The development of the Battery Charging Adapter Kit and the Optical and Instrument Repair Shop Kit and the requirement for the General Office and the 10 kw Generator would also be reviewed.

At the present time all the required SEVs have been completed. The Optical and Instrument Repair Shop Kit has been developed, production authorized, and is now in progress. The 10 kw Generators are in progress. The Battery Charging Adapter Kit has not been approved to date, although it is under consideration, and the General Office Van is still deferred. The latter will remain deferred for some time as vehicles held 'in-lieu' are considered satisfactory for their purpose.

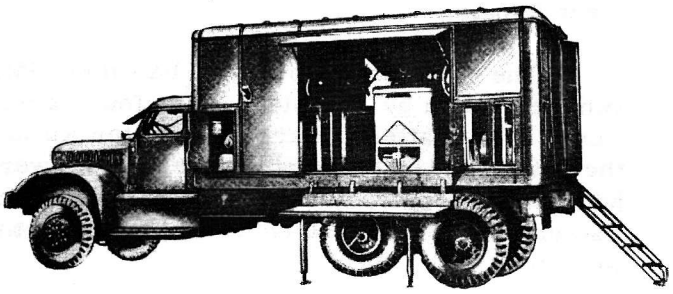
The following is a brief description of the old CMP Machinery Lorries, followed by a description of the newer SEVs mounted on SMP vehicles.



Welding Shop, Truck Mounted, 300 amp, KL, 15 cwt, 4x4, Code 172108

The 15 cwt KL was used for electric welding in the field. This was a 15 cwt 4x4 with a 300 amp welder mounted on the back.

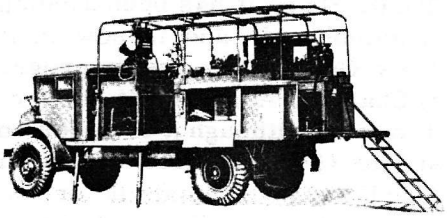
The 300 amp welder was driven by a 95 hp engine. It had a tubular superstructure covered by a tarpaulin. A portable grinder, welder's table, welder's screen, vise, cables and accessories were carried.



Machine Shop, Truck Mounted, M, 4 ton, 6x6, Code 175304

The M Lorry was used by RCEME and RCASC workshops for mechanical repair of automotive components and parts, including battery charging and paint spraying.

The 4 ton Diamond T based vehicle had a van-type body, 15 ft long, with rear entrance doors. The sides dropped to provide outside work benches. Equipment included bench lathe, paint sprayer, valve grinder and refacer, pinhole grinder, bench grinder, brake reliner, and a gasoline powered battery charger. Power for the machine tools was from an engine-driven generator.



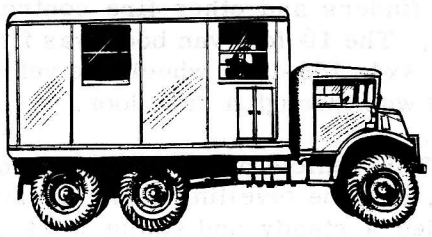
Machine Shop, Truck Mounted, M (Mk 2) 3 ton, 4x4, 158-in wb

A Mark II vehicle was produced. This was used by RCEME and RCASC workshops for general MT service including the mechanical repair of automotive components, necessary metal turning, drilling and grinding, also battery charging and paint spraying.

The 3 ton GS-type steel body was 12 ft long, with a superstructure covered with a tarpaulin. Entrance through the rear was by a step-ladder. Equipment included a 7 1/2 kw dc generator driven by PTO, a lathe, drill, grinder, valve refacer, valve grinder, paint sprayer, spark plug cleaner, battery charger, vices and hand tools. The Mr 2 had greater manoeuverability and a less conspicuous silhouette than the 4 ton, 6 wheel type.

The Machinery F was used by RCEME workshops in the field for the testing and repair of automotive electrical equipment such as starters and generators and their components. This kit was based on the 3 ton, 6x6, 160-inch wb chassis. There was a 14 ft steel van body, and entrance was gained through doors in the rear. There were ventilating windows along the sides.

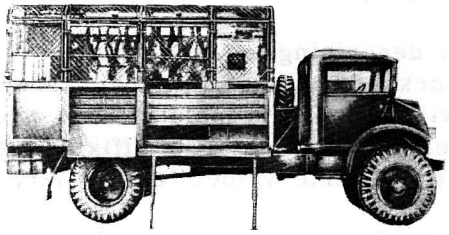
Equipment included a DC generator driven by a gasoline engine, ammeters, voltmeters, special test equipment, and armature baking oven. The small doors on the right front side immediately below the window cover the ventilator for the generator engine.



Machine Shop, Truck Mounted,
F, 3 ton, 6x6, 160-in wb, Code 175139

The Machinery I was used in the field for charging 6-volt and 12-volt storage batteries by the constant potential and modified constant potential method. The equipment was designed to handle a total of 100 6-volt and 50 12-volt batteries simultaneously.

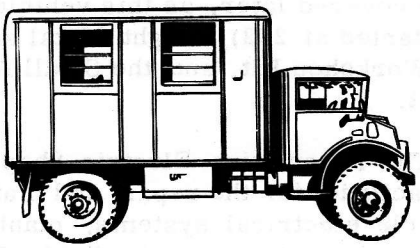
The vehicle was a 158-inch wheelbase 3 ton, 4x4, GS, with a tubular superstructure covered by a tarpaulin. The necessary screening and blackout equipment was included. The equipment included the GP battery charging generator driven by a gasoline engine.



Machine Shop, Truck Mounted,
I, 3 ton, 4x4, 160-in wb, Code 175132

The Machinery DI was used by RCEME workshops for metal-working operations required in the repair, of instruments in the field. The 12 ft long steel van body was on a 3 ton, 4x4, 158-inch wb chassis. Entrance was gained through doors in the rear and ventilating windows were fitted.

Equipment included a precision lathe, watchmaker's lathe, drill press, benches, vises and hand tools. Power supply for machine tools was supplied by a generator trailer.



Machine Shop, Truck Mounted,
DI, 3 ton, 4x4, 158-in wb, Code 175140

The Instrument Repair was used for the repair of instruments such as watches, compasses, binoculars, telescopes, dial sights, range-finders and other fire control instruments. The 10 foot van body was fitted to the 3 ton, 4x4, 158-inch wheelbase vehicle. Entrance was through a side door.

This vehicle provided dust-proof working areas, and the levelling jacks at each corner provided a steady and stable work platform. Lockers, shelves and benches were included for the special tools and equipment. The floor was covered with linoleum as were the benches. Equipment included a small battery charger and a watchmaker's lathe. This vehicle is listed as CODE 175126 INSTRUMENT REPAIR SHOP, TRUCK MOUNTED, 3 ton, 4x4, 158-inch wb. (No photograph of this vehicle is included).

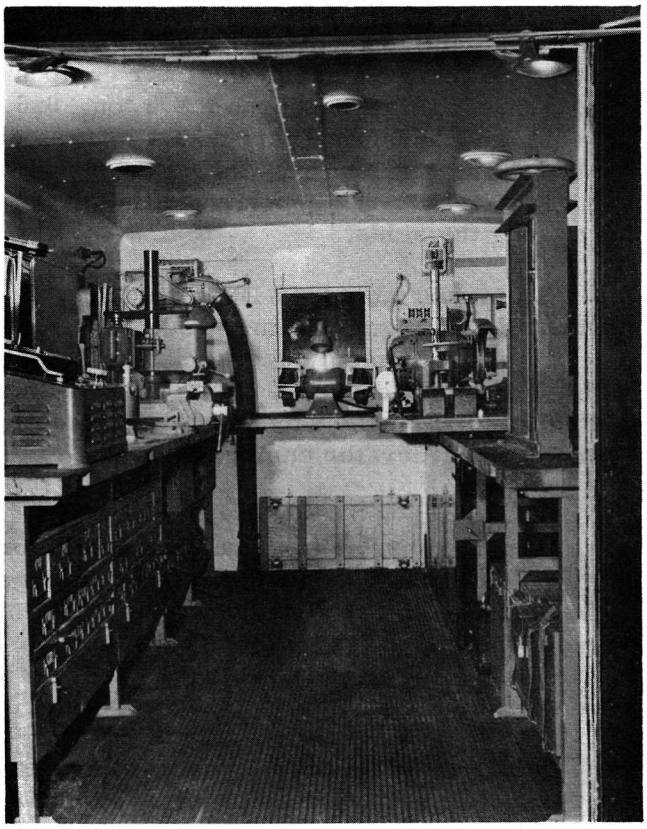
In describing the SEVs produced at 202 Base Workshop and 204 Base Workshop no attempt will be made to include those programs which consisted primarily of affixing a generator set or electric welder to a trailer.

The SEVs for aircraft and radar repair will be the subject of a future article.

The SEVs covered in this article are the Automotive Electrical, Automotive Machine Shop Kit Load A, C and E, Armament Machine Shop Load F and H, Instrument Machine Shop Kit (But not the Optical and Instrument Kit, which may be covered later, as this vehicle has just been started at 202), Light Metal and Blacksmith Workshop Kit, and the Small Arms Repair Kit.

The Automotive Electric Shop Kit provides facilities for the repair and maintenance of vehicle electrical systems, plant electric motors and generators in the field. The basic vehicle is the Truck Shop Van 2 1/2 ton.

Main items of equipment include a generator and starter tester, a 10 ton press, a 1/2-inch bench drill, a distributor tester, 4 1/2-inch bench vise, and a thermostatically controlled drying oven. Two workbenches are installed along the sides of the vehicle, pro-

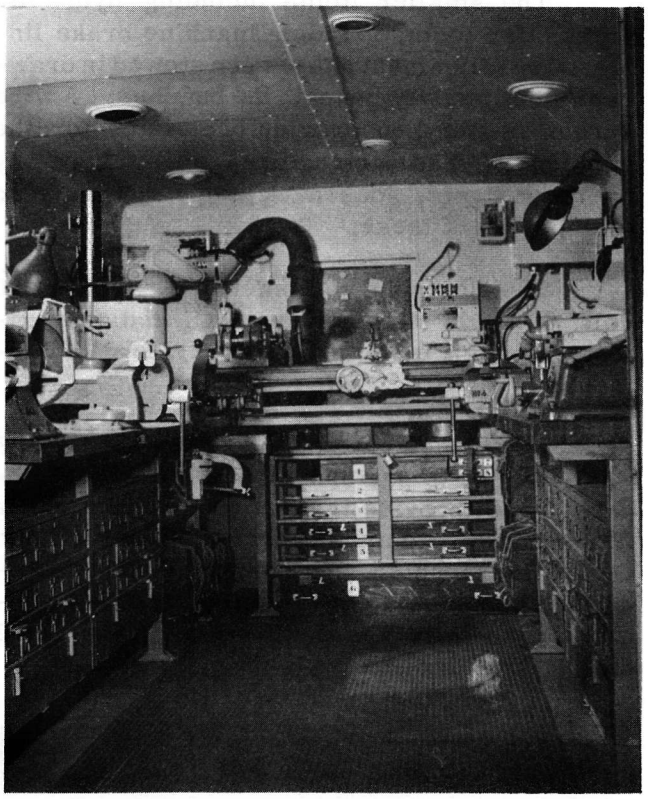


Shop Equipment, Automotive, Electrical Repair, Truck Mounted, 2 1/2 ton, 6x6, van. Code 124706

viding working space and drawers and shelves for the tools, instruments and other accessories used with the kit.

The oven is located under the left hand bench at the back of the vehicle. On the left at the front is the generator and starter tester, and to the right of this is the bench grinder. On the right hand side, from front to back, is the 10-ton press, 1/2-inch bench drill, and the distributor tester. Facilities for receiving compressed air from an outside source are provided. A portable folding bench and a creeper is included in the kit.

The Automotive Machine Shop Kit Load A is designed for the repair and inspection of automotive equipment in the field. The basic vehicle is the Truck Shop Van 2 1/2 ton. Main items of equipment include a 9-inch metal lathe,



Automotive Machine Shop, Truck Mounted, Load A, 2 1/2 ton, 6x6, van, Code 124707

bench drill, vises, bench grinder, valve refacer and threading set. Cabinet-type benches are along the front and sides of the vehicles.

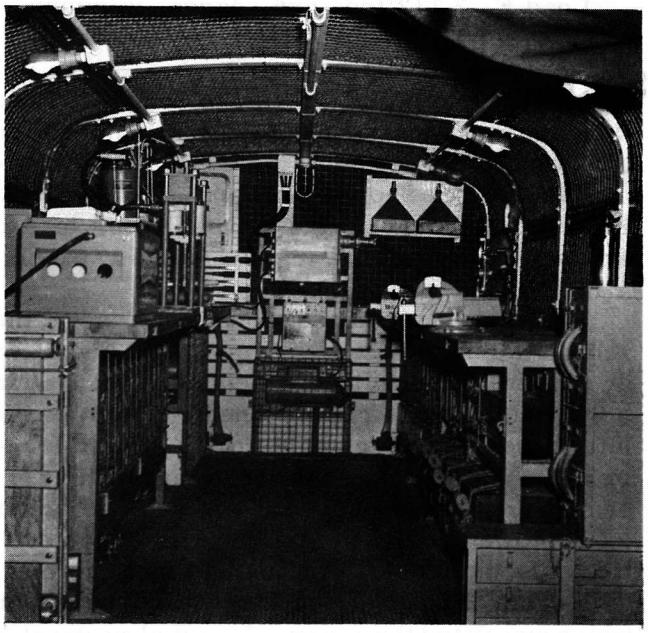
The major items of equipment are fitted on these cabinet benches, and a visual tour from rear left around to rear right shows the bench grinder, bench drill on the left side, the lathe at the front, the long work bench on the right with a vise and valve refacer.

Smaller items of equipment, drills, extractors, files, lathe equipment, gauges, etc, are stowed in the drawers and shelves beneath the benches. These can be seen in the photo. Illumination is provided by ceiling lamps, supplemented by two adjustable lamps at the front and left side benches. Power to operate all electrical equipment is supplied by a 10 kw generator, trailer mounted. This is a separate item, not part of the kit.

The Automotive Machine Shop Kit Load C is also designed for the repair and inspection of automotive equipment in the field. The basic vehicle is the Truck Cargo 2 1/2 ton with winch.

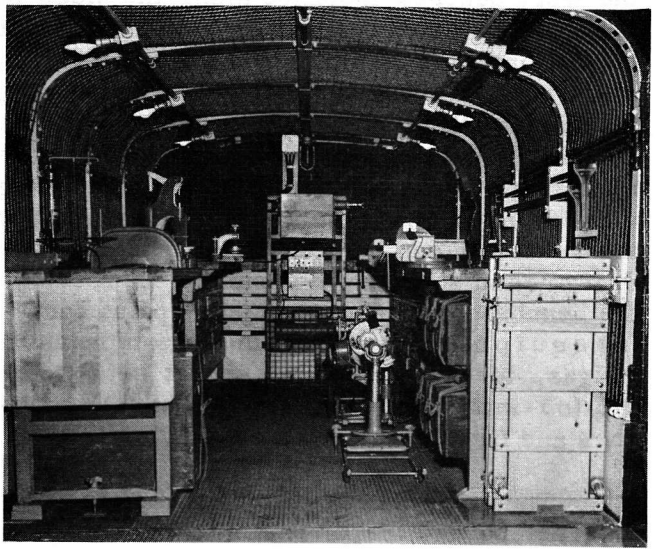
Main items of equipment are mounted on the work benches installed along the sides of the vehicle. From rear left around to rear right the major items of equipment are installed in this order; along the left is the spark plug cleaner, a 30-ton shop press, and beneath the bench at left front is the air compressor, at the right front is the portable grinder, and along the side are the vises. (A creeper stowed at the rear left can be seen in the photo). The drawers and shelves which can be seen beneath the benches contain impact tools, paint spraying equipment, vacuum and compression gauges, torque wrenches, socket sets (from 3/8 to 1-inch drive), battery equipment, wrenches and files.

The wire screen is fitted between the superstructure and the tarpaulin to provide protection for the equipment. The working area is illuminated by overhead lights, each fitted with a power outlet.



Automotive Machine Shop, Truck Mounted, Load C, 2 1/2 ton, 6x6, cargo, w/winch Code 124311

Power to operate all electrical equipment is supplied by a trailer-mounted generator, again a separate item of equipment and not part of the kit.



Automotive Machine Shop, Truck Mounted, Load E, 2 1/2 ton, 6x6, cargo, w/winch. Code 124309

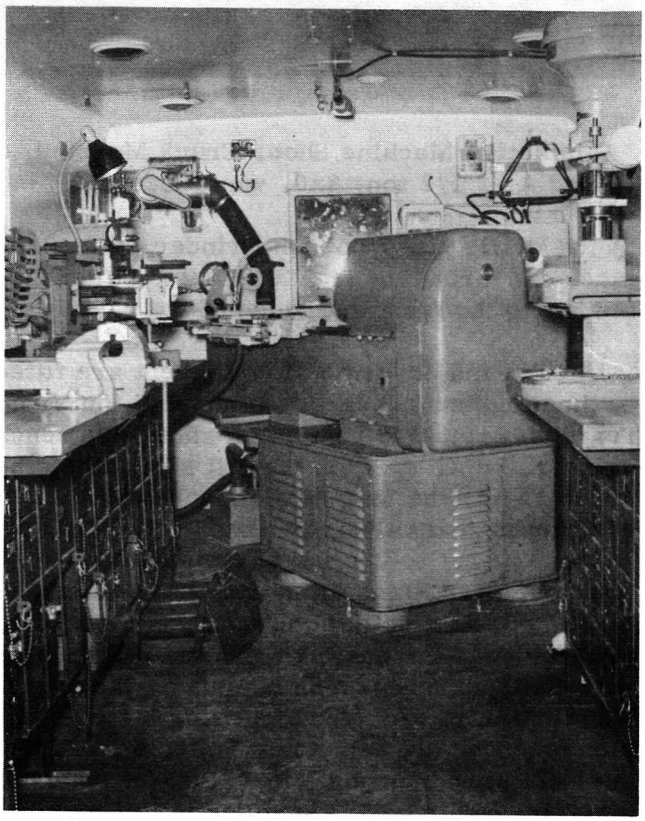
The Automotive Machine Shop Kit Load E is also designed for the repair and inspection of automotive equipment in the field. The Automotive Machine Shop Kits Load A, B, C, D and E are all associated equipments. This load E is based on the Truck Cargo 2 1/2 ton w/winch.

Benches are fitted along the sides of the vehicle and major items of equipment are fitted or stowed in the following sequence from rear left around to rear right. The first item on the left is the sewing machine in its stowed location, then the brake shoe servicing machine and brake bleeders, creepers, the vehicle ladder in its stowed position, and a work surface continues to the front. Continuing along the right side from the front is a large work bench on which are fitted the vises. Mounted on the side above the bench is the toe-in gauge, while on the floor is the brake-drum turning lathe in its stowage position.

The smaller items including hydraulic jacks, tire tools, grinding machine brake lining, wheel alignment gauges are stowed in drawers and on shelves beneath the benches. A wire screen is fitted to provide protection for the equipment. The working area is illuminated by overhead lights, gooseneck lamps are provided to supplement these.

The electrical equipment operates on 120 volt, 60 cycle single phase, AC, and approximately 2.5 kw is required to operate all equipment.

The Armament Machine Shop Kit Load F was designed to perform mobile armament repairs and to provide inspection facilities in the field. The Armament Machine Shop Kit Load G, Trailer Mounted, and Load H, Truck Mounted, are associated equipments. The basic vehicle for the load F is the Truck Shop Van 2 1/2 ton.



Armament Machine Shop, Truck Mounted, Load F, 2 1/2 ton, 6x6, van, Code 124705

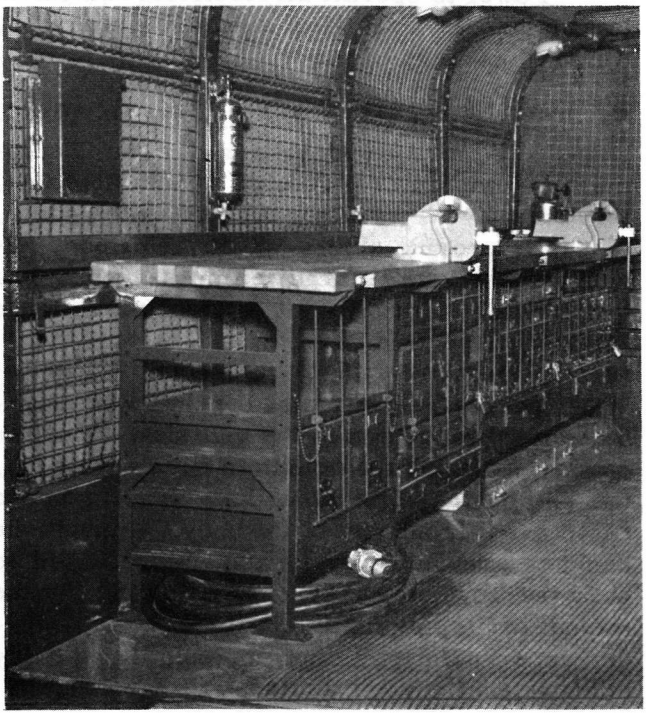
All items of the kit are installed inside the van body. Again cabinet benches are installed to provide work surfaces, and storage by means of drawers and shelves. These benches do not extend along the full length of the sides. There are only three cabinet benches, one at the rear left on which is mounted the 7-inch bench-type shaper and a vise. On the rear right cabinet bench the 7/8-inch electric bench drill is mounted. The third cabinet, at the right front, is used to store the lathe accessories, and as a base for the 8-inch bench grinder. The lathe is mounted diagonally in the centre part of the vehicle; it is a pedestal-type, 16-inch swing, 30-inch centres. The power supply required is 110/220 volt 60 cycle, single phase.

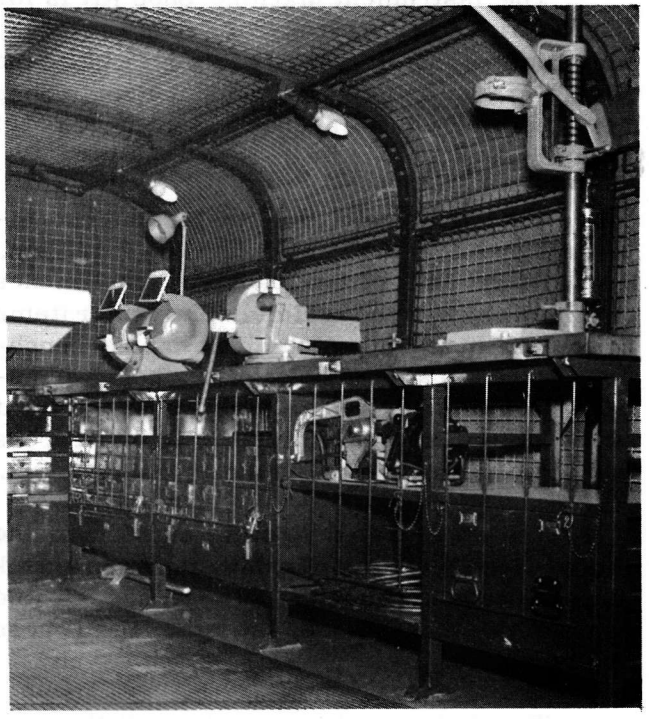
The Armament Machine Shop Kit Load H, used in conjunction with the Load F and Load G, is designed for the repair and maintenance of armament equipment in the field. The basic vehicle is the Truck Cargo 2 1/2 ton with winch. Two work benches are provided, one on each side of the vehicle. On the full length left hand bench two vises are fitted. Beneath the bench are drawers and shelves to hold smaller items of equipment. The bench on the right hand side is also full length. A larger vise is fitted to this bench, and toward the front of the bench is fitted the power grinder, toward the rear is the drill press.

In the photos can be seen the series of drawers along the left side of the vehicle, while along the right is a combination of drawers and shelves. Items such as a power hacksaw, drills, portable grinder, gauges, taps and dies, are stowed in these drawers and shelves.

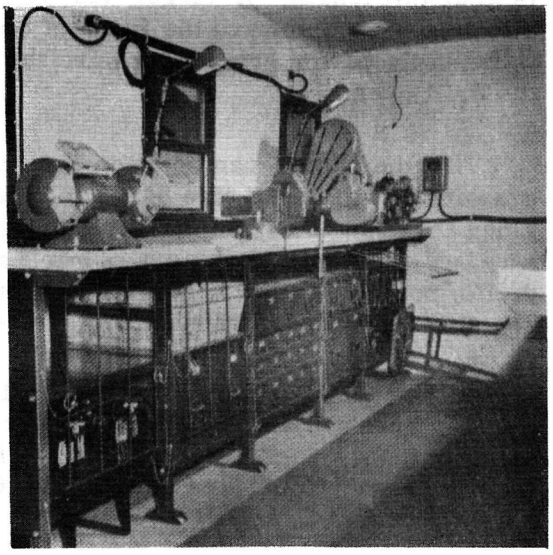
The overhead lights used to illuminate the working area can also be seen. Power outlets are provided at each lamp location. The electrical equipment operates on 120 volt, 60 cycle single phase, AC.

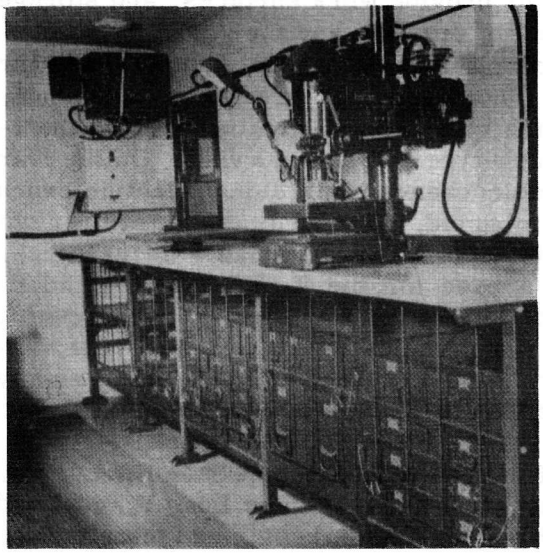
The wire screen is fitted between the superstructure and the tarpaulin to provide protection for the equipment.





Armament Machine Shop, Truck Mounted, Load H, 2 1/2 ton, 6x6, cargo, w/winch.
Code 124313





Instrument Repair Shop, Truck Mounted, 21/2 ton, 6x6, van, Code 124715

The Instrument Machine Shop Kit is for the repair and maintenance of speedometers, tachometers and optical instruments in the field. An Optical and Instrument Repair Shop Kit is being produced at the present time at 202 Base Workshop.

The basic vehicle for the Instrument Machine Shop Kit is the Truck Shop Van 2 1/2 ton. The kit consists of two cabinet-type benches along the sides of the vehicle. The major items of equipment are mounted on the cabinet benches. On the left side at the rear is a bench grinder, toward the centre is a vise and at the front is the lathe. On the right side is the drill press and further forward the mechanic's turntable.

The overhead lighting as seen in the photos is supplemented by four gooseneck lamps, two on each side. These are located near the vise and grinder, the lathe, drill press and turntable.

The shelves and drawers beneath the cabinet benches are used to stow smaller items, thread chasers, drills, blow torch, gauges, hand grinder, wrenches, etc.

Power to operate all electrical equipment is supplied by a trailer mounted generator, which is not part of this kit.

The Light Metal and Blacksmith Workshop Kit is more properly known as Shop Equipment, Sheet Metal Working, Truck Mounting. However, by either name the role is the same, that is to provide mobile sheet metal body repair and blacksmith facilities in the field. The basic vehicle for this kit is the Truck Cargo 2 1/2 ton.

There are two metal benches with laminated hardwood tops in the vehicles. The one on the left is the full length of the cargo body, the one on the right about half the length and fitted to the front part of the body. Beneath the benches are the drawers and shelves used to stow the smaller items of equipment. These include drills, clamps, blowtorch, porto-power, spray paint, welding equipment and many other miscellaneous items.

Major items fitted to the benches are a vise on the left side, an 8-inch bench grinder on the right. At left front, below the bench, an

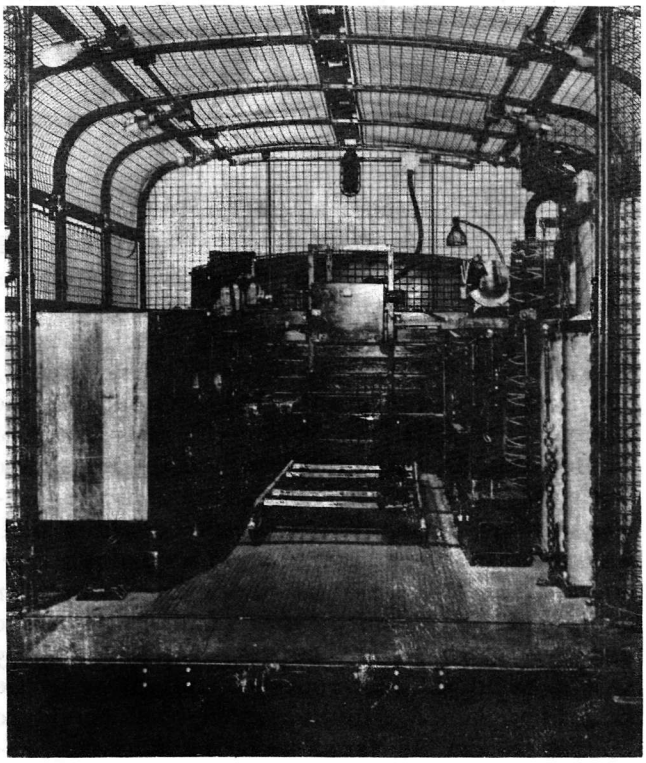
air compressor is fitted. A folding bench and collapsible water tank are also items carried. The space on the right side, from the bench to the rear of the body, is used to hold the oxygen and acetylene bottles.

The working area is illuminated by overhead lights. Power outlets are located at each lamp outlet.

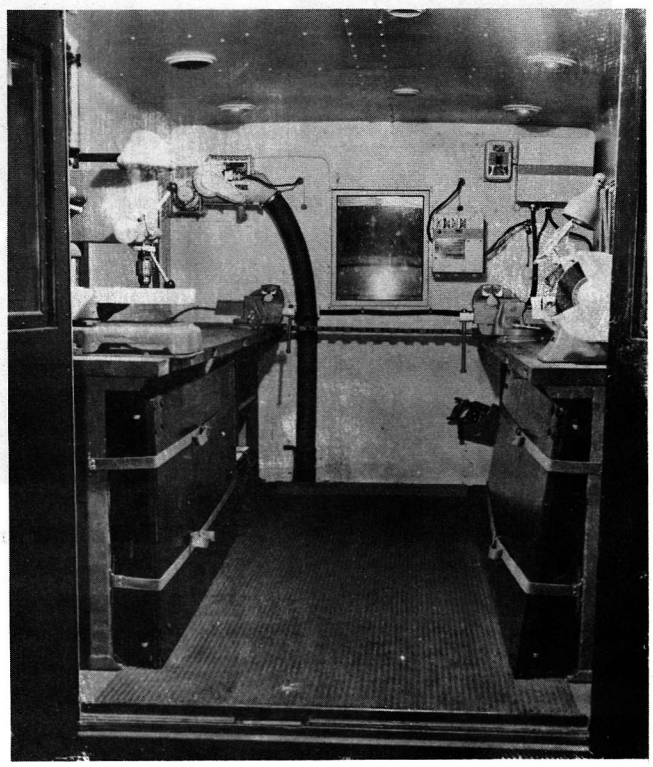
A wire screen is fitted between the superstructure and the tarpaulin to provide security for the equipment. The equipment operates on 120 volt, 60 cycle, single phase, AC.

The Small Arms Repair Shop is, as the name implies, for the maintenance and repair of small arms in the field. The basic vehicle is a Truck Shop Van 2 1/2 ton. Two work benches of steel construction with wooden tops are fitted, one to each side of the van body. Drawers and shelves are provided for the storage of small tools and equipment. These include such items as blowtorch, calipers, drills, files, extractors, reamers, threading sets, wrenches, gauges, etc. On the left bench a 1/2-inch bench drill is mounted as is a vise with a swivel base. On the right bench is another swivel base vise and an 8-inch bench grinder.

Illumination is provided by overhead lamps, supplemented by gooseneck lamps. Power required to operate the electrical equipment is 110 volt, single phase, AC.

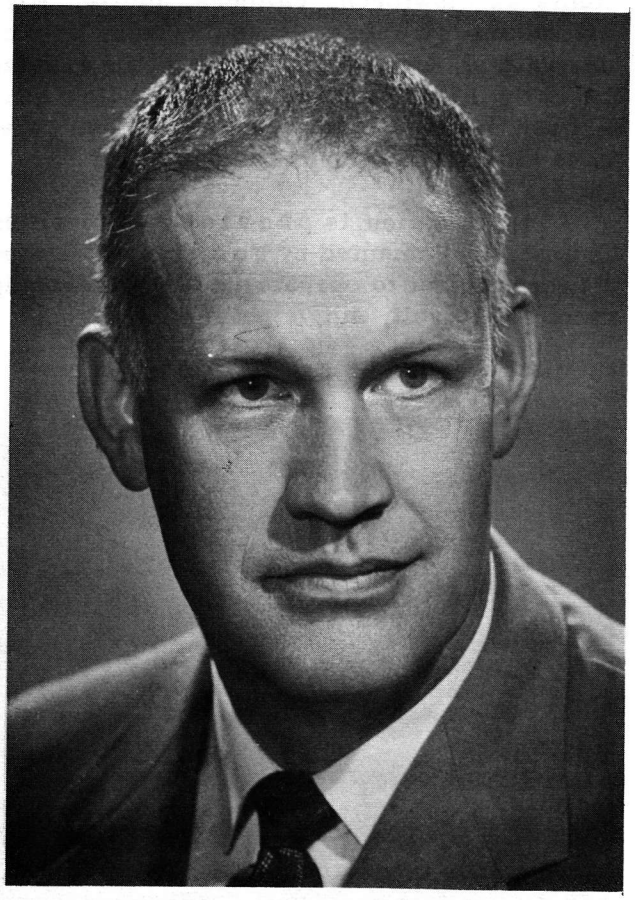


Shop Equipment, Sheet Metal Working, Truck Mounted, 2 1/2 ton, 6x6, cargo, Code 124306



Small Arms Repair Shop, Truck Mounted, 2 1/2 ton, 6x6, van, Code 124719

IN RETROSPECT



Mauritz Burlin

Lloyd George Rupert, MC
President and General Manager
The Brackman-Ker
Milling Co Ltd
New Westminster, BC

The Award of The Military Cross to
Captain Lloyd George Rupert
Officer Commanding, 84 Light Aid Detachment
attached to
22 Canadian Armoured Regiment
(Canadian Grenadier Guards)

By Lt Col RH Hodgson CD

The 22nd Canadian Armoured Regiment (CGG) and its Light Aid Detachment fought in the North West European campaign from 27 July 44 to the end of The Second World War.

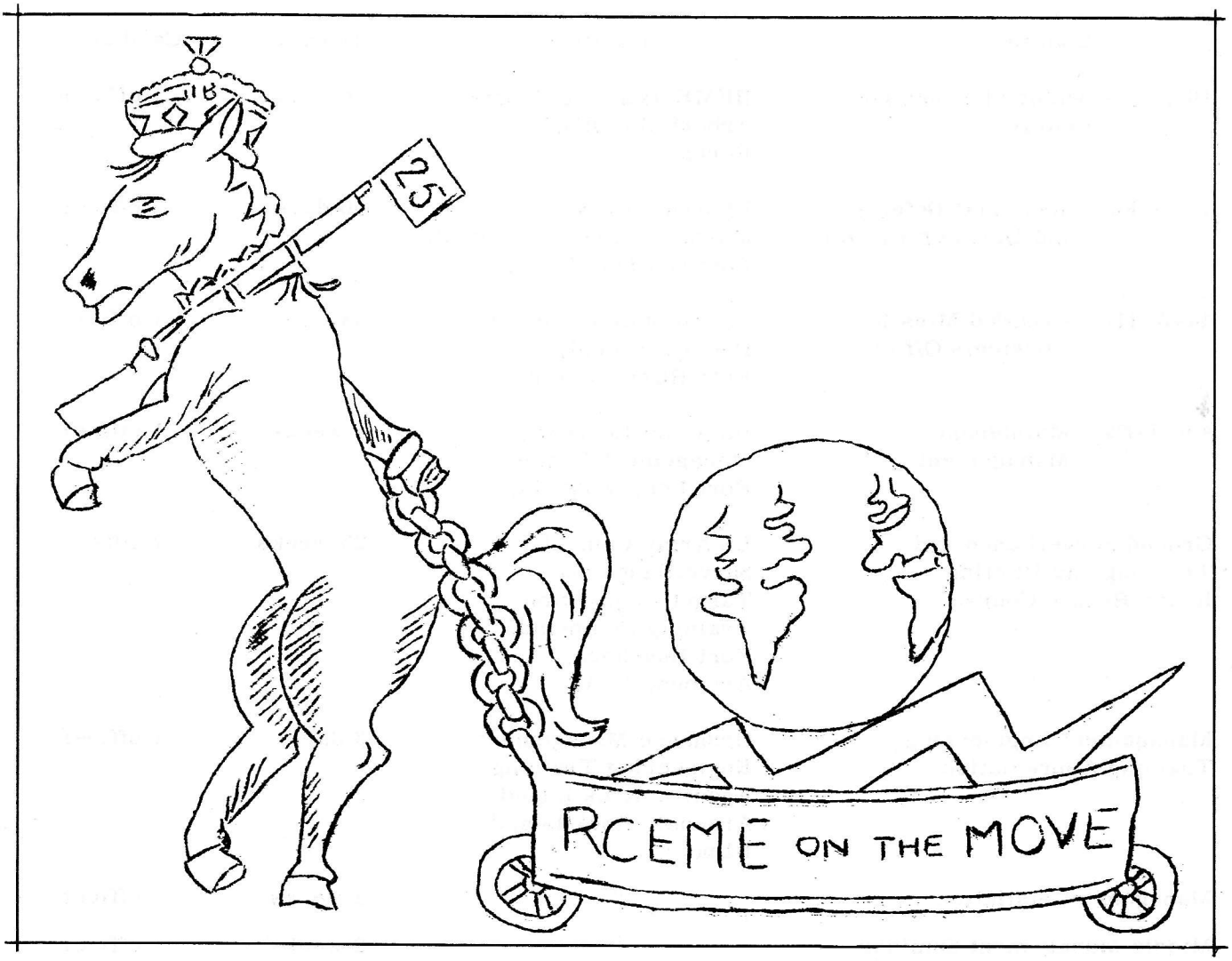
Captain Rupert consistently contributed to the success of his Regiment by his energetic recovery of tracked and wheeled vehicles. His lengthy citation records many heroic deeds which in Rupert's opinion were just the normal run of the day duties.

Captain Rupert's citation reads in part:

"He has on several occasions, through his ceaseless untiring efforts and with boldness in the face of enemy fire, recovered many vehicles, both tanks and B" vehicles. Had the Regiment been forced to operate without them, it would have been greatly handicapped. In the operation at Hill 195, France, 1 mile south of St Helaire, on 9 August 1944, the Regiment had suffered several tank casualties and when ordered to pull out there were three tanks still serviceable, if recovery could be brought forward. The Hill was still under enemy mortar fire, shell fire and 88 mm guns covered the area. Captain Rupert personally recced a way in and directed his recovery equipment to the tanks concerned. He supervised the complete operation and the tanks were successfully recovered. Again in Belgium at Wouwsche Plantage near Steenbergen in October 1944, Captain Rupert was again called on to effect recovery of several tanks temporarily out of action due to mines. The woods north of the railway track contained machine gun positions and mortars. Again Captain Rupert, without considering his own safety, personally directed and supervised

the successful recovery of these tanks. Again in Germany near Wennenthal, the Regiment suffered tank casualties due to bazooka fire. Two tanks were recoverable but the area was still under heavy enemy shell fire and intense small arms fire, and again Captain Rupert, without thought of his own welfare, personally supervised and directed and successfully effected recovery of the tanks. The service which 84 Light Aid Detachment has given this Regiment has been of the highest and most satisfactory standards in all phases of their work. In effecting repairs, carrying out modifications, improvising equipment, maintenance of guns and recovery, the Light Aid Detachment's excellent record, due to the leadership and executive ability of Captain Rupert, has kept this Regiment in a state of fighting efficiency by virtue of its being able to maintain in the field a maximum of vehicles for all operations."

Captain Rupert, Armt QMS LS Davis and Fitter AFV Cfn JA Wiltsie set out in the LAD scout car truck on the 1st of January 1945 to reconnoitre the Scheldt Estuary north of Bergen op Zoom where several of the Regiment's tanks had been knocked out. Unknown to Rupert and his men, the area had been mined by the enemy during the night. The scout car was blown up killing AQMS Davis and severely wounding Cfn Wiltsie who died two days later. Rupert escaped with a few gashes and some severe burns and returned to his command on 11 February 45 after hospitalization.



Cfn HE Knight, 16 Coy

TRAINING NOTES

By Maj RW Libbey CD

Courses for RCEME Regular Army Personnel

In May of each year, the Training section of PTO submits applications for various types of courses required in the next training year. We make every effort to ensure that sufficient courses are requested to:

a. meet our needs for instructors,

b. ensure that we have trained personnel available to support new equipments when they are introduced into service, and

c. provide specialized training for officers and selected other ranks.

The following courses have been approved for the training year 1962/63. This list includes only courses not available through Canadian service facilities. Details on other courses will be published in subsequent issues.

Course	Location	Duration	Candidates
16/A/2 - Senior Management Course	REME Training Centre, Arborfield, Reading, Berks.	14 weeks	1 officer
19-G-F8 - Industrial Defence and Disaster Planning	US Army Provost Marshal General's School, Fort Gordon, Georgia.	10 days	2 officers
44-A-1181 - Guided Missile Systems Officer	United States Army Air Defence School, Fort Bliss, Texas.	38 weeks	1 officer
400-I-F4 - Maintenance Management	US Army Logistics Management Centre, Fort Lee, Virginia.	8 weeks	1 officer
Ground Surveillance and Tracking and Plotting Radar Repair Course	US Army Combat Surveillance and Target Acquisition Training Command, Fort Huachuca, Arizona, USA.	23 weeks	2 ORs
Management Engineering Training Appreciation	Ordnance Management Engineering Training Agency, Rock Island Arsenal, Rock Island, Illinois.	3 days	1 officer
Management Statistics	"	2 weeks	1 officer
Middle Management Seminar	"	2 weeks	1 officer
Organization Planning	"	2 weeks	1 officer

Course	Location	Duration	Candidates
Organization Planning Seminar	Ordnance Management Engineering Training Agency, Rock Island Arsenal, Rock Island, Illinois.	1 week	1 officer
Procedure Analysis	"	2 weeks	1 officer
Statistical Quality Control	"	3 weeks	1 officer
Top Management Seminar	"	2 weeks	2 officers
Work Methods and Standards	"	5 weeks	2 officers 1 OR
Work Planning and Control	"	3 weeks	1 officer 1 OR

By now you are probably wondering how you can get on one of these courses. Although final selection of candidates is made by the Training section, in conjunction with D Pers RCEME, you can make your requirements known in either or both of the following ways:

a. Write a letter to your CO or to the Comd or Area EME if you are attached to a non-RCEME unit.

b. Make a specific request for the particular course or courses in each of your annual confidential reports.

Training for RCEME Militia Tradesmen

During the Inspector RCEME visit to the Militia units in Quebec Command, some of the unit commanders asked whether selected Militia tradesmen could be attached to RCEME School to attend parts of applicable courses in progress.

The RCEME School will soon be filled to capacity with newly-enrolled regular army personnel attending group 1 courses in all trades. To enable this heavy training load to be handled as smoothly as possible, RCEME School will start vehicle mechanic courses whenever sufficient candidates are available. Other trade courses will likely start on the same basis. This means that actual course dates will not be known until one or two weeks prior to the commencement date.

RCEME Militia unit commanders who wish to attach personnel to RCEME School should make their requests through Area or Command channels. The request should show the type of training required, the candidate's regimental particulars and the dates when he will be available for training. When the requests have been approved by Command Headquarters, AHQ (DEME) will determine the feasibility of incorporating the training requested into the existing course load at RCEME School.

Team work is the key to effective operation of any group of people. Team work is dependent on joint endeavour. It does not flourish where the emphasis is on individual achievement, individual responsibility or individual reward.

Try This Training Test

By Maj RW Libbey CD

Here are ten questions designed to test your knowledge of training matters. Consider each question carefully and write your answers on a separate sheet of paper so that you won't give somebody else a 'bum steer'. When you have completed all questions turn to page 40.

1. The new trade specification format used in the Canadian Army Manual of Trades and Specialties (CAMTS) is used only by the Army. True or false?

2. Can officers and other ranks of the Canadian Army take extramural courses at public expense? How about correspondence courses?

3. Who is responsible for preparing and issuing Canadian Army Trade Specifications?

4. Many of our workshops are located in the vicinity of technical schools and business colleges. Is it possible to have military tradesmen trained at these schools?

5. When a man is being upgraded, either by trade test or by course, what is the effective date of his qualification in the next higher trade group?

6. Can a man draw trades pay for two or more trades at a time?

7. Craftsman IM W rench passed a group 3 trade test in his trade. At that time he had 18 months paid service as a group 2 tradesman. How much longer does he have to wait before he is eligible to draw group 3 trades pay?

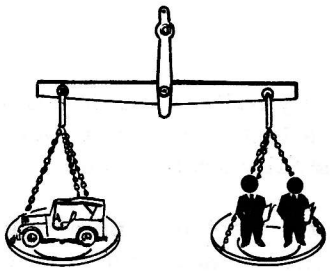
8. Can a tradesman lose his trades pay on grounds of inefficiency?

9. Craftsman HI Frequency is a group 2 tradesman serving with 4 CIBG. He is eligible for a group 3 course and will very soon have spent the necessary time as a group 2 tradesman. He is not due for rotation for at least one year and cannot be returned to Canada to attend the qualifying course. Can he be qualified in Europe? How?

10. Craftsman W Recker has completed a concentrated in-job training program which covered all the serials in the trade specification for the next higher group in his trade. Must he be certified proficient before he can be trade tested?

BALANCING MANPOWER AND WORKLOADS

By Capt JE Kerr



If you have never been faced with the problem of trying to fit a few more jobs into production, or of trying to find jobs for a few tradesmen who are all caught up on their work, then you probably are not one of the following: OIC workshop, control officer, production supervisor, work planner, or section foreman. If you are one of these people and have never received a 'rocket' from Command, Area, or the Front Office that made you shift all routine work aside to make room for 'crash action' work, then you probably were posted in yesterday.

The secret is to balance the manpower available with the work to be done. Some do this by the seat-of-the-pants method; some do it mathematically. Some simply pile the work up and say: "We'll do it when we get to it". The seat-of-the-pants method operates fairly well in small shops, although occasionally this planner is caught with the aforementioned clothing at half mast. The mathematician does a better job but finds that statistics alone are too rigid and he can't adjust for priorities, delays, people AWL, and so on. The last type of planner either likes people continuously 'on his back', wants a posting, or is going to pension at the end of the month.

So it becomes fairly apparent that the successful planner must use every means possible if he is to operate efficiently and give the best possible customer service.

A good planner has all of the following data available:

a. Total available manhours for each section;

b. Leaves, courses, training, etc, that will cut into the availability;

c. Section backlogs (both unfinished work and work due in);

d. Low priority work that can be called in (eg, depot stocks);

e. Seasonal peak loads (last years activity summaries when summer camp equipment was being processed);

f. Standard repair times and flat rate manuals;

g. National average repair times (National Annual Workshop Activity Summary);

h. An approximate percentage of quick-repair jobs and priority jobs that can be expected;

i. An approximate percentage of equipments held up for parts at all times.

Now he is ready to go to work.

He plots the daily availability of each section and deducts casualties (leave, sick, etc). He applies the backlogs and determines the number of days work already committed. Where the workload is not enough for the available manhours he 'earmarks' the section as one where he can get extra help if needed (and vice-versa).

A good planner knows that he can expect emergency repairs and 'hot potatoes'. He therefore leaves a small percentage of his manpower uncommitted. He also knows that there will be work held up pending arrival of parts, so he overcommits the section by a predetermined percentage.

A good planner knows how much depot or other low priority work there is in the area and also knows what peak loads he can expect. He can often advise in phasing leaves and training periods so that they don't conflict with busy seasons.

Standard repair times should be used wherever possible to estimate work to be done. If tradesmen don't complete the work within the estimated time, don't panic. If they consistently take longer something is wrong and it's time to investigate. If there is no standard repair time for a specific job use the national average repair time or if you have recently completed an identical job, check the time taken for it. National average repair times are excellent for programming. Some jobs will take twice the national average, but some will require only half as much, so on a block of items what is lost on one is gained on another, and you generally break even.

So that's the basic principle of loading. If all the facts are known it becomes only necessary to add a few ingredients such as ingenuity, motivation, and common sense. Add to these the integrity of clerical people, and seldom if ever will you have to resort to the ouija board or crystal ball to determine how to cope with any situation that may arise.

WORKSHOP CONTROL PROCEDURE

This seems to be a good opportunity to answer some of the questions of a general nature brought up during the contracts 'bull-session' of the recent Workshop Control Procedures Course at the RCEME School.

Q. When will workshops get the latest invoice certification and coding stamp?

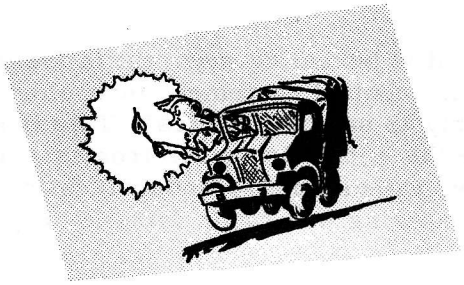
A. DOS assure us that you have not been forgotten. Some have been received and issued and the remainder will be issued as soon as received from the contractor, expected within a month.

Q. Can invoices be certified by WOs in charge of an AWD or temporarily in charge of a workshop?

A. A good question, some District Treasury Officers (DTOs) accept a WO's certification, others do not. We feel that the invoice should be certified by the officer or warrant officer most directly concerned with the work and the contract. As the RCAF include warrant officers, and as signing authority can be requested for civilians of the rank of Clerk 3, we have been unofficially advised that the term "Officers Commanding" used in the Signing Authorities, PART B, page 2 (RCEME Authorities, under "Units") is intended to include OICs and WOICs and that a WO may certify, if his appointment is shown on the certification as "in-charge", "second-in command", or "control officer". By the same token, a CO Coy may designate a Production Officer, or Production Supervisor as a Control Officer for invoice certification purposes. If you find that the above is not acceptable to the DTOs, please let us know and we will take the problem up officially with D Budget.

Q. Can the $50 Petty Cash Advance be increased?

A. This came as a surprise. Some workshops do not use Petty Cash, while others are so pleased with its simplicity that they suggest increasing the maximum advance. We feel that it could be used to advantage by most workshops, but until we have more experience in the business, we would prefer not to ask for an increase in the maximum per order or the advance.



WHERE ARE WE GOING?

Some thoughts on the effects of present trends in equipment on the electrical trade.

By S sgt CG Ashdown, 16 Coy RCEME

This article was prompted by the changes made to specifications of the electrical mechanic's trade, which have recently gone into effect. These changes were obviously meant to bring the specifications into line with the actual operations as they exist in RCEME workshops. Let us examine these changes and see why they were necessary.

The first and most important change was to give to the vehicle mechanic the fault-finding and repair functions of the electrical systems on ordinary wheeled vehicles and engineering equipment, leaving the repair of electrical components to be carried out by the electrical mechanic in his shop. This is the method that has, in fact, existed for some time. The average shop has a system whereby generators, starters, regulators, batteries and distributors are exchanged by the vehicle mechanic, when he has diagnosed the fault as being in any particular component. The non-serviceable components are then processed by Ordnance and sent back to the workshop to become part of the regular workload of the Electrical Section. This section is well equipped to repair and test these components, since it possesses a distributor tester, coil and condenser tester, armature tester, generator and starter test stand and many other pieces of similar test equipment.

The next change concerned armoured fighting vehicles. In this case, while the electrical and electronic systems were left with the electrical mechanic, ignition systems were placed entirely in the hands of the vehicle mechanic. Anyone who has experienced the operations involved in changing spark plugs or timing the Meteor engine in the Centurion will appreciate that this change is entirely correct. The training and tool kit of the electrical mechanic were not in line with this function. On the other hand, the electrical circuits and components on the Centurion and Ferret are sufficiently complex that they fit the training and test equipment available to the electrical mechanic. A look at the control panels on these vehicles will disclose that a knowledge of bridge circuits, temperature compensating and bucking windings, and carbon piles, is necessary to repair and adjust them, and this is not at present included in the vehicle mechanic's syllabus.

I must say in passing that knowledge of complex electrical circuits is not beyond the vehicle tradesman. Having just finished a discussion on electronic ignition systems with a vehicle artificer, in which he held his own on the respective merits of transistor over thyratron types, I can certainly say that he is capable! It will be seen there must be a division of responsibility at some point, and experience has shown the present dividing line is best.

To this point, I have discussed the changes made in the specifications for electrical mechanics and how they affect present conditions. How then will they affect us in the future? In this respect, we must examine trends in the trade, both existing and approaching implementation, since new Army vehicles will incorporate these modifications when they become standard equipment.

Firstly, many civilian and some Army wheeled vehicles are fitted with three-phase alternators which, beside giving a higher output and being more compact, are also more reliable and trouble-free in operation than the conventional DC generator system. The alternator is usually fitted with silicon diode rectifiers to rectify the three phase alternating current.

Next, a development that is just around the corner - electronic ignition systems. In these (there are several possible variations)

the contact breaker points are used to trigger a simple pulse generator circuit consisting of transistors, or a thyratron, or even a silicon-controlled rectifier. Whatever the type, all have the same features - the points are arranged to carry a minute non-inductive current, ensuring long life. The spark produced drops off very little over the full range of engine speeds. The circuits, being electronic, have a low power consumption and, if semi-conductors are used, are extremely resistant to damage.

Many other automotive developments are in the wind. One that was a pipedream yesterday is becoming a reality thanks to miniaturization and the rapidly decreasing cost of semi-conductors: This is a device that will engage the brakes when one automobile approaches too closely to another.

These trends point up the fact that vehicles will tend to become, at least electrically, a collection of 'black boxes', any of which the vehicle mechanic will identify as faulty and ship to the Electrical Section for repair and calibration.

This tendency toward automotive electronics and the fitting of such equipments as the electronic navigational aid to armoured fighting vehicles, can only upgrade the electrical trade and accentuate a trend I have observed over the past eight years. This trend is that the electrical trade is gradually moving away from the purely automotive basis it had, and is approaching the electronic trades. The specialty that is becoming apparent is toward the electronic control equipment technology - is it too early to say cybernetics? This is an area where the accent is on electronics used for controls, rather than for communications, quantity measuring and radar missile or gun control.

Much of what I have said is open to argument, but one thing is clear. The electrical artificer and mechanic must study electronic theory, especially semi-conductor devices, such as silicon diodes, silicon controlled rectifiers and zener diodes. These may be incorporated into such commonplace equipments as battery chargers, voltage regulators, ignition systems and gasoline vehicle heaters. Both these tradesmen should, in any event, seek a nomination for the semi-conductor course held at the RCEME School. The variety and versatility of semi-conductors render them likely to appear in many of the appliances which electrical mechanics repair, since they give the manufacturer features to exploit that he cannot afford to ignore and, of course, they will be used in generator control panels. Caterpillar have already incorporated them in their SRSE Type (statically-regulated statically-excited) generator sets.

To summarize, therefore, the answer to the question 'Where Are We Going?' would appear to this particular electrical artificer to be 'Upward and Onward to Better Things', among them, I piously hope, Group 4A trades pay ...

TECHNICAL NOTE ——

ASSEMBLIES PRESERVED WITH MT OIL PRESERVATIVES

It has been ascertained that in at least one location personnel are stripping and cleaning preservative lubricant from Centurion elevating gearboxes before placing into service.

Preservative oils are compatible with operational oils and it is not necessary to clean or flush assemblies before being placed in service. Neither will the slight dilution which may take place have any affect on the operation.

Through long time in storage the preservative oil may have become gummy or incipient rust may have taken place. In most instances this condition can be satisfied by filling the assembly with operational oil, operating for about 15 minutes, draining and refilling.

PERSONAL CAPACITIES FOR MANAGEMENT

By Lt REM Nourse 14 Coy RCEME

The question of promotion to various levels of responsibility in RCEME is a twofold problem: it involves not only an assessment of trade and technical ability, but also consideration of a second factor that looms somewhat mysteriously over the whole affair - managerial ability. To many, unfortunately, the suggestion of the term 'management' or a derivative of it brings nothing to mind but a number of shapeless and vaguely-defined ideas and, as a result, the tendency has all too often been to ignore it. Technical ability has been the prevailing influence.

Technical ability is a relatively simple factor to gauge and, certainly, in the early stages of a career in our Corps, it is a most important consideration. A certain minimum level of technical competence is essential for an individual to work effectively in RCEME. In the case of other ranks, we have of course established various levels of trade proficiency that must be attained before promotion can be considered. For officers, an engineering degree or proven trade ability through previous service is the basic requirement. However, as one progresses toward the higher levels of command, whether they be of artificer or field officer grade, the technical factor rapidly diminishes in importance, and managerial competence balloons into prominence.

Fortunately, the importance of considering the managerial ability of an individual has now been firmly recognized in our Corps. However, for many, it is yet to be clearly defined. What is there about a man that makes him a better supervisor than the next? In essence, what are the personal capacities that make a successful manager?

Just as raw metal is the basic material with which a machinist must work, so are human beings the raw commodities with which the manager must contend. A good manager must therefore have the capacity to understand and work with people, for they are the essence of his profession. It is not within the scope of this article to explain how he can attain this ability, for the topic of human relations is a full study in itself. However, it can be said that this is the area in which many potential candidates for higher levels of responsibility stumble. Understanding and being able to work with people is not just a desirable quality; it is an essential one without which no manager can get along.

It has been said that the average person spends from 40 to 60 per cent of his time communicating, and that in the case of the manager, this figure is likely to be closer to 80 per cent. Clearly then, the ability to communicate effectively, both orally and in writing, is a basic requirement for a manager. The task of the manager is one of delegating work to subordinates and of supervision of that work. The failure of a manager to communicate in a manner that can be understood can cost an organization dearly in lost time, energy and repetition of work. To our dismay, this is the capacity in which many of our managers in RCEME, particularly at the artificer level, are grossly deficient - most of us need not go far to see the results of poor communication.

It has been pointed out that one of the tasks of a manager is supervision. Supervision entails responsibility, and in reality, some people simply cannot carry responsibility. The pitfalls encountered by the man who cannot be trusted to do a job without himself being supervised will only be compounded should he be permitted to move up the ladder in a chain of command. Responsibility entails the accountability for the performance of duties not only of oneself, but even more important, of one's subordinates. The ability to carry responsibility is yet another requirement of administrative or managerial work.

The everyday meat of a manager's job is

that of directing, and in this activity, a manager must have an ability to solve problems and make decisions. This is not too difficult a task when the area in question is one with which the manager is thoroughly familiar, but this is not always the case. The solving of problems and making of decisions is somewhat of an art or science which taxes considerably on an individual's power of analysis. To some, this capacity is naturally inborn, while still others require training in such a vital area.

There are boundless limits in managerial work for the man with a capacity for independent thought and personal enterprise. There is seldom a "book answer" to the problem confronting the manager, nor is there a unique solution. It is here that originality, flair and new approaches to old problems are of utmost importance. It is here too that the average administrator is left behind by the good one. Creative thought is an invaluable asset that quickly spotlights the man who is going places in management.

The art of successful management employs the use of new ideas and theories to improve existing conditions. In any organization, there are areas in which present administrative practices can be improved, and this can only be properly carried out when our administrators have learned to apply the ideas and concepts of good management which have been, and continue further to be, developed. The ideas are there, but the degree of success of their application is a matter entirely dependent upon the capability of the manager in implementing them. Therefore, although our personnel are taught the principles of management, it is only the individual with the capacity to apply these modern skills and concepts who will be a good administrator and manager.

Administration of the work of other people is a skill that can be acquired through practice and study. While it is true that a practical man with little or no training in management can be a successful administrator, it is also true that, without study of the subject, he is limited in the results that he can achieve. However, this does not imply that every man can be trained to be a manager - some people have a natural disability for this particular profession. Rather, it can be said more specifically that some individuals lack to a greater or lesser extent the capacities that are important to administrative or managerial work. The recognition and fostering of these capacities, as they have been outlined here, is an important step in the selection of the future leaders in our Corps, and in the building of an efficient management team. It is the responsibility of all ranks who have supervisory functions.

STOP PRESS ITEM

MILITIA RADIAC MECHANIC INSTRUCTORS COURSE

Arrangements are now being completed to conduct this course at RCEME School during the period 9 Jul 62 to 20 Jul 62.

Scope. The scope of the course will be based on the new trade specifications for Militia Radiac Mechanics.

Prerequisites. Candidates should be Senior NCOs who have had some electrical or electronic training and will be employed as radiac instructors in the unit.

Applications. The course will be limited to 15 candidates. Vacancies will be allotted to commands. Detailed information will be distributed through command channels.

JOB SATISFACTION

By Maj JM Treleaven CD

The age old question of "Why do men work," has no doubt been considered at some time by all supervisors and managers. The reasons of course are many and varied including money, security, prestige, holidays, a car or house and the price of a beer. The most accepted reason, however, seems to be - "because of the personal satisfaction they derive from a job well done".

Most of us are usually aware of our abilities and our performance and are able at the end of a good day to inject ourselves with the serum of satisfaction that we all seek. There are many though, who need a frequent shot of encouragement, a pat on the back, to keep them activated to the point where their performance level approaches their capabilities. Among these will be found a few 'perfectionists' who, without continued assurance, will become discontented but who can contribute a great deal if recognized and properly supervised.

We frequently hear people complain, "How can I get interested in my job? It's just one pile of paper after another or one bucket of bolts following the last". Here management is presented with the problem of monotony and specialization. For years industry has studied the effects of specialization on job satisfaction. The main outcome of these studies has been the recognition that repetition and monotony have different effects on different people. A job that appears very monotonous to some may provide a large degree of satisfaction to others. They may like the routine and orderliness and may even resent having to apply their mental activity to the job. They may not be capable of a more complicated task.

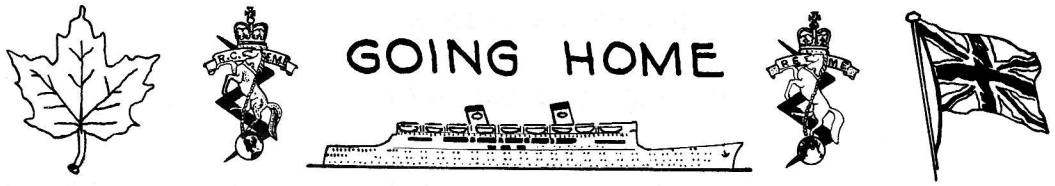
On the other hand, routine and repetition cannot be tolerated by some. They will eagerly seek the challenge of new tasks and responsibilities but, having mastered them, rapidly loose interest and become dissatisfied unless new challenges are at hand to lead them on. They fail to follow through. This problem of specialization and the right person for the job applies to all levels of employment from the shop floor up into the executive level.

Assessing a job to determine its nature in terms of simplicity, repetition and monotony is not too difficult, but personal likes and dislikes must be guarded against. Predicting the degree of satisfaction that any individual will gain from a certain job is more difficult. Trial and error may have to be resorted to. It may be considered advantageous to rewrite job descriptions incorporating a rearrangement of tasks for certain key positions in order to gain greater effectiveness of the encumbent. This amounts to filing corners in the hole so the square peg will fit, but care must be exercised to be sure the actual gain justifies the means.

There are many recognized ways of maintaining interest in work. Setting readily-attainable targets or goals to mark progress; keeping all concerned informed of the reasons why, will go a long way in maintaining interest. As mentioned, the pat on the back and the word of encouragement by managers at all levels will aid in developing the team spirit and good morale. The dynamics of leadership become involved since men will work much harder and more conscientiously for a real live 'boss' than for just the army or government.

While attempting to build this interest and satisfaction in the job with its associated increase in performance we must also watch for signs of disinterest among those we supervise. The rotten apples in the barrel need special attention but these are not easy to detect - many may never be known. Some men give the impression of being greatly dissatisfied but may only be 'old soldiers'. They may be beneficial as they add colour and excitement to many dull situations. An alert supervisor will notice the man who is contributing only part of his effort and ability. A discrete enquiry may improve

(continued on page 35)



Major CW Bendall has been Exchange Officer with DEME since 22 Aug 59. He left us at the end of March to return to the UK, where his first posting is to the Senior Management Course at Arborfield.

We asked Major Bendall if he would provide the Bulletin with a short resume of his reactions to the RCEME operation.

By Maj CW Bendall REME

I am just concluding a most interesting and enjoyable two and a half year tour of Exchange duty in Canada and have been invited to record some of my impressions of the Royal Canadian Electrical and Mechanical Engineers. The background against which my impressions have been formulated includes the geographic immensity and climatic extremes of Canada - the need to defrost a Centurion tank for 2-3 days before repair can be started is a condition not normally experienced by REME tradesmen.

Throughout my tour, I have been fairly close to RCEME Base Workshop production, and I am impressed by the technical capability and flexibility of such production. The current BOBCAT development project at 202 Base Workshop, Montreal, involving the design and development of some 12 kits for mounting special equipment into the BOBCAT constitutes a very marked change in RCEME activity. This presents an unequalled opportunity for the application of RCEME engineering ability and creative thinking during the design and development phase of an equipment, as opposed to its being used later to overcome technical shortcomings which should have been foreseen by the designers, but which were not. The use of Critical Path Arrow Diagrams to plan these projects and to report and record their progress is also a marked step forward and shows, in my opinion, how close the Corps of RCEME is to current technicological advancement.

My tours with the Inspector RCEME stand out as highlights of my Exchange tour during which I was able to visit RCEME Workshops on the ground. From these tours, it is evident to me that our two Corps have many common problems. I think it is very encouraging that RCEME Field Workshops serving in Canada have at last got some reliable field equipment and are, I understand, about to get a more realistic, continuous workload together with the manpower necessary to accept this load. Such workshops, deploying in support of Brigade group formations, constitute:

(1) the best possible training to be found during peace-time soldiering;

(2) a ready-made "test-bench" upon which the equipment, trade, establishment and organizational suitability of the Corps can be tested against the changing patterns of tactical deployment; and

(3) an unequalled opportunity to strengthen RCEME prestige and relations with the rest of the Army.

The current RCEME policy of requiring equipment casualty diagnosis and repair to be carried out as far forward as possible by the deployment of high quality tradesmen in the forward areas and the creation of Forward Repair Teams is another indication of how closely our two Corps work.

The methods of workshop planning and control introduced in Apr 59 were both timely and well thought out, and indicate clearly that "resistance to change" is being resisted. I consider the control procedures have been successful, but have not yet reached perfection, nor will they ever. However, so long as thought

is stimulated, recorded, and presented, improvement will continue. The excellent management training currently being given to most courses at the RCEME School at Kingston should ensure the continuation of such constructive criticism. Again, in my opinion, any person returning to his unit after attending one of these courses, who finds himself thinking that the principles of management cannot be applied "in this case" should consider the possibility that he may still be resistant to change.

One area to which a critical examination could be directed concerns the uses being made of equipment repair statistics, not only in Army Headquarters, but also in Command Headquarters. It would seem logical that equipment maintenance cost histories have some definite relation to equipment obsolescence, and therefore, to the planning of future equipment procurement. For example - cost history statistics are essential for the implementation of a vehicle casting policy, viz; a policy which requires the automatic and progressive disposal of equipments as they reach predetermined age, mileage, and/or annual maintenance cost levels; and which also requires the progressive annual procurement of replacement equipments, thus eliminating or at least reducing to a minimum, the need for peak procurement expenditure during any one fiscal year. Such a policy, if adopted, would eventually eliminate situations in which vast stocks of ten-year-old "new" vehicles are held in Service Depots, together with the resultant RCEME headaches inherent in such holdings.

In conclusion, I would like to say that my exchange tour has been not only a pleasure, but a privilege and I consider myself most fortunate to have had such an experience.

JOB SATISFACTION continued from page 33

the situation or indicate further study, a tune-up, perhaps by specialists to bring him back to near full performance.

The 'will to work' is governed to a large extent by the satisfaction gained from achievement. The promotion of this feeling of achievement is a major challenge to supervisors and management. Personnel appraisal and assignment; production targets; the pat on the back; and dynamic leadership by 'the boss' are but a few of the many approaches to increased effectiveness of the individual. The man that starts to think of his job as he comes in the gate in the morning and leaves with a feeling of satisfaction has quite likely earned his pay. We need more of these people.

Know your men, their capabilities, their performance and their problems. Then you too will experience an increase in your job satisfaction.

DID YOU KNOW ---

Twenty years before Robert Fulton's voyage in the steam powered "Clermont", James Rumsey had successfully demonstrated both steam power and water jet propulsion. In 1784, and again in 1787, he successfully demonstrated his steam powered, water jet propelled boat. Travelling 4 mph against the current of the Potomac, Rumsey's feat was witnessed by General Washington.

Rumsey's machine consisted of a steam engine and a pump cylinder, which were mounted vertically on a common shaft, one directly above the other. The up-stroke drew water into the pump cylinder from a duct leading to the bow of the vessel. On the down-stroke the water was ejected from the cylinder through a "trunk in the heel."

-SAE Journal "Chips"

1962 MANITOBA AREA RCEME CURLING BONSPIEL

RCEME took to the ice at Camp Shilo Curling Club on the week-end 3 - 4 Feb 62, to enjoy the most successful Bonspiel ever held in the area. Sixteen rinks participated in the three-event Bonspiel as entries arrived from Churchill, Regina, Rivers, Winnipeg, and of course Camp Shilo. A few civilian employees were able to take part and 7 Tech Regt CA(M), the defending champions, were represented by a strong rink skipped by WO 1 Christie.

Saturday's curling consisted of three draws for each rink and competition was keen. But sore hands, stiff shoulders and general weariness did not detract from the enjoyment of a banquet held that evening as all contestants took the opportunity to renew old acquaintances and compare notes on RCEME throughout the area.

The semi-final and final draws concluded the Bonspiel on Sunday and trophies and prizes were presented to the successful rinks.

"A" Event - Winner - 212 Wksp RCEME -
S sgt J Klassen
Runner-up - 7 Tech Regt (M) -
WO 1 AM Christie

"B" Event - Winner - HQ 10 Coy RCEME -
Mr AD Langlois
Runner-up - 12 Coy RCEME -
S sgt AC Munday

"C" Event - Winner - 213 Wksp RCEME -
WO 1 NR Brown
Runner-up - 213 Wksp RCEME -
WO 2 TC Hooper

Crying Towel - 18 Coy RCEME -
Capt J Brewster

So keen was the competition that one prominent Technical Officer, clad only in shorts, was observed early Sunday morning practicing his sweeping at the open door of his quarters, during one of the worst blizzards to hit Shilo this winter.

212 Workshop RCEME, Shilo, was host for the occasion, with S sgt "Jack" Klassen competently handling the chore of drawmaster.

Maj EA Williams, Area EME, presenting the trophy to skip S sgt Klassen, with L cpl Robinson, S sgt Arscott and S sgt Grouette

LETTERS TO THE BULLETIN

To the Editor:

I read with interest your article on Capt Kingsmill (RCEME Tech Bulletin, Jan 62) and the crossing of the Gari River in Italy, May 44, and thought you might be interested in the enclosed snapshot.

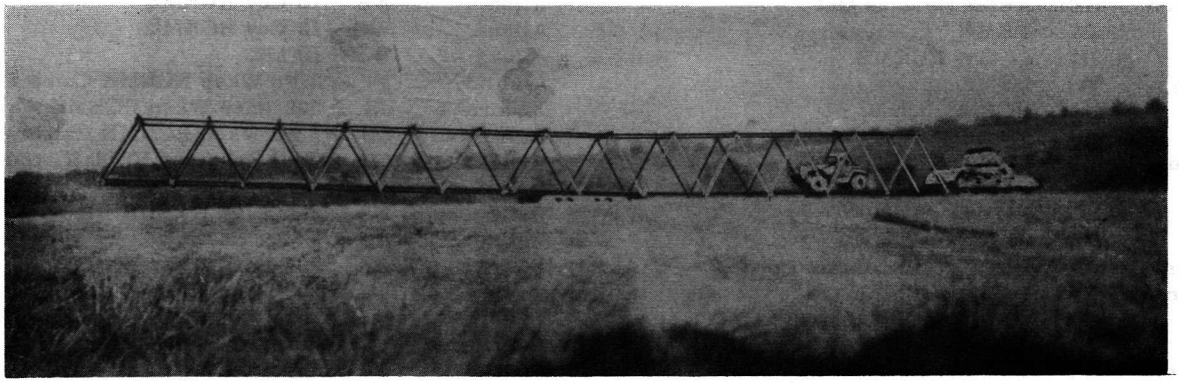
Unfortunately this picture is not of the best, conditions being as they were, but with a good glass it can be seen; the two tanks, and a jeep already on the bridge to add counterweight. Picture was taken just before bridge overbalanced and fell on opposite shore.

After the years, memory is faint. I can't recall the date, nor who was in charge of project, but along with some others I was called out to consult and recommend anything I could. However, I believe some of the preparation was done at our workshop, 5 Canadian Armoured Troops Wksp, and the place was somewhere near Rimini. The entire launching required but 57 minutes I remember (not under fire of course).

I also believe this is the only actual picture of the trial so if it is of any use to you, you are welcome to it. I would like to have it or a copy returned to me when finished.

Fred R Toms, WO 2
202 Base Workshop
Montreal

(Can other readers shed any further light on this incident? At press time we are awaiting information from the RCE. -Editor)



To the Editor:

I think one of the best features of the Tech Bulletin is the Who's Where; it's nice to know where your friends are.

But why not get down a little lower in rank and locate the staff sergeants for us? Most of these senior NCOs are group 4 and 4A artificers and are important people in our repair organization.

D MacLeod WO2
DEME

(Good idea. We've checked with WO2 Rawling, D Pers (RCEME) who says "Can do, if you give me a little time", so watch for it. -Editor)

WHO'S WHERE

LOCATION OF RCEME WARRANT OFFICERS

Class 1

Anscomb	GW	5 Coy RCEME
Baynes	CH	6 Coy RCEME
Beddows	RS	RCEME School
Boshier	R	AEEE Orleans Ont
Brennan	RS	RCEME School
Brown	AT	10 Coy RCEME
Brunton	AC	8 Coy RCEME
Buck	WM	14 Coy RCEME
Clarke	DL	RCD LAD RCEME Camp Gagetown
Conway	RF	16 Coy RCEME
Cozens	SD	RCEME School
Dodds	TH	RCEME School
Drew	CV	AEEE Orleans Ont
Dudley	J	D Org AHQ
Elliott	WEC	4 Coy RCEME
Fernets	JM	11 Coy RCEME
Fox	HR	AEEE Orleans Ont
Gallier	H	RCEME School
Gladwin	CH	CADEE Valcartier Que
Guilfoyle	ME	LdSH(RC) LAD Calgary
Hammond	GT	AEEE Orleans Ont
Hayes	JW	DEME
Henry	JE	11 Coy RCEME
Houlton	VH	DEME
Hunder	BAJ	RCEME School
Hurd	LR	202 Base Wksp RCEME
Jackson	O	10 Coy RCEME
James	JW	RCAC School Camp Borden
Keech	HL	DEME
Knight	RA	16 Coy RCEME
Knowles	GA	RCAC School Camp Borden
Langford	WH	2 Coy RCEME
Leach	FH	CJATC Rivers Man
Leon	BU	1 Fd Wksp RCEME Calgary
Leonard	WV	14 Coy RCEME Camp Borden
Lewis	CB	202 Base Wksp RCEME
Lewis	SM	8 C H LAD Europe
Longley	GM	12 Coy RCEME
Lowry	LH	DCER Ottawa
MacDonald	DJ	DEME
MacDonald	J	RCEME School
MacCague	LT	204 Base Wksp RCEME
McInnes	DM	18 Coy RCEME
McMurchy	WS	202 Base Wksp RCEME
Meloche	JB	Quecom 'I' Staff Mil, Montreal
Mercer	JL	RCEME School
Neil	T	Cent Ont Area 'I' Staff, Oakville
Norbury	G	13 Coy RCEME
Oakes	GAM	DEME
Owen	LR	7 Coy RCEME
Parker	JC	204 Base Wksp RCEME
Patterson	DJ	2 Fd Wksp RCEME Camp Petawawa
Richardson	W	202 Base Wksp RCEME

Class 1

Riley	GA	DEME
Rivers	AM	3 Coy RCEME
Robertson	WG	DEME
Rowe	AW	RCEME School
Shaw	JE	3 Fd Wksp RCEME Camp Gagetown
Sherman	CG	DEME
Sinclair	L	DEME
Snell	JD	56 Cdn Inf Wksp Middle East
Spackman	JH	RCSA Shilo Man
Tatham	J	11 Coy RCEME
Thivierge	AJ	AEEE Orleans Ont
Walsh	IS	AEEE Orleans Ont
Weston	ET	4 Fd Wksp RCEME Europe
Warren	DH	202 Base Wksp RCEME
Wilkinson	EJ	202 Base Wksp RCEME
Young	RD	16 Coy RCEME

Class 2

Adams	RMJ	204 Base Wksp RCEME
Allen	EB	10 Coy RCEME
Allen	WG	18 Coy RCEME
Almey	B	DEME
Ambler	J	2 Fd Wksp RCEME Camp Petawawa
Anderson	JS	202 Base Wksp RCEME
Anderson	SB	1 Fd Wksp RCEME Calgary
Armstrong	JH	Cent Ont Area 'I' Staff, Oakville
Axford	DS	DEME
Bailey	E	204 Base Wksp RCEME
Balmer	AJ	5 Coy RCEME
Barrett	GJ	202 Base Wksp RCEME
Barrey	WAG	202 Base Wksp RCEME
Bellefontaine	AEL	3 Fd Wksp RCEME Camp Gagetown
Boisvert	L	5 Coy RCEME
Both	TA	6 Coy RCEME
Bottle	DA	1 Coy RCEME
Bouchard	JM	16 Coy RCEME
Bougie	I	202 Base Wksp RCEME
Bovey	ET	3 CIBG LAD RCEME Camp Gagetown
Brooks	LFJ	8 Coy RCEME
Broomer	TF	4 Coy RCEME
Brown	AW	3 Coy RCEME
Burgess	EW	3 CIBG LAD RCEME Camp Gagetown
Burnett	JH	204 Base Wksp RCEME
Campbell	DN	RCEME School
Carefoot	WN	202 Base Wksp RCEME
Cassidy	GP	RCEME School
Celli	AJ	202 Base Wksp RCEME
Christensen	AJ	204 Base Wksp RCEME
Clarke	DC	13 Coy RCEME
Clyde	KT	204 Base Wksp RCEME
Cochrane	HM	DEME
Coles	JC	16 Coy RCEME

Class 2

Colson	AR	3 Coy RCEME
Coughlin	AF	56 Cdn Inf Wksp Middle East
Crane	CE	RCEME School
Cross	FT	204 Base Wksp RCEME
Crosson	JH	10 Coy RCEME
Cunningham	JM	2 Fd Wksp RCEME Camp Petawawa
Dainty	HW	2 Fd Wksp RCEME Camp Petawawa
Dance	GN	RCEME School
Dand	RJM	13 Coy RCEME
Davis	WE	RCEME School
Deans	AG	202 Base Wksp RCEME
Dew	AE	10 Coy RCEME
Dewar	J	DEME
Doherty	E	202 Base Wksp RCEME
Doherty	SF	202 Base Wksp RCEME
Dorey	EE	RCD LAD RCEME Camp Gagetown
Dormer	NH	202 Base Wksp RCEME
Drake	EA	6 Coy RCEME
Drobot	W	204 Base Wksp RCEME
Duncan	FP	1 CIBG LAD RCEME Calgary
East	SW	2 Coy RCEME
Elliott	BD	202 Base Wksp RCEME
Evans	RL	12 Coy RCEME
Fairbairn	TM	10 Coy RCEME
Feller	DH	4 Coy RCEME
Ferguson	HG	3 Coy RCEME
Fielding	C	204 Base Wksp RCEME
Foley	HEF	3 RCHA LAD RCEME Europe
Ford	RC	1 CIBG LAD RCEME Calgary
Fourcaudot	C	5 Coy RCEME
Fryer	JWA	7 Coy RCEME
Gall	GJ	CADEE Valcartier Que
Gavriloff	W	AEEE Orleans Ont
George	AG	4 Coy RCEME
George	LJ	FGH LAD RCEME Camp Petawawa
Gibbs	BF	14 Coy RCEME
Gill	DE	AEEE Orleans Ont
Given	RJ	204 Base Wksp RCEME
Goss	RB	1 RCHA LAD RCEME Camp Gagetown
Graham	AA	13 Coy RCEME
Graham	JC	3 Coy RCEME
Gribble	DL	3 Coy RCEME
Griffin	GW	3 Coy RCEME
Halliday	AG	4 CIBG LAD RCEME Europe
Hanash	J	2 Fd Wksp RCEME Camp Petawawa
Hardy	JR	3 Fd Wksp RCEME Camp Gagetown
Harper	JM	RCEME School
Healy	TW	202 Base Wksp RCEME
Henderson	KW	4 Fd Wksp RCEME Europe
Hewison	RW	4 CIBG LAD RCEME Europe
Hicks	AL	6 Coy RCEME
Hinton	WG	RCEME School
Holt	JS	2 CIBG LAD RCEME Camp Petawawa
Hooper	TC	10 Coy RCEME
Hutley	HA	14 Coy RCEME
Jackson	AF	CJATC Rivers Man
Janssen	MEJ	202 Base Wksp RCEME
Jodoin	LH	RCEME School

Class 2

Johnson	GM	3 CIBG LAD RCEME Camp Gagetown
Johnson	WA	7 Coy RCEME
Johnstone	T	204 Base Wksp RCEME
Jones	HR	FGH LAD RCEME Camp Petawawa
Joyner	EF	CADEE Valcartier Que
Kayne	HG	4 Fd Wksp RCEME Europe
Keating	EA	3 Fd Wksp RCEME Camp Gagetown
Kelly	MP	16 Coy RCEME
Keogan	MJ	4 Fd Wksp RCEME Europe
Kirkpatrick	AM	8 Coy RCEME
Kraemer	KE	RCEME School
Krupp	HH	10 Coy RCEME
Laird	WW	14 Coy RCEME
Lasuta	W	8 C H LAD Europe
Lauret	JE	1 Fd Wksp RCEME Calgary
Lawrence	BJ	4 CIBG LAD RCEME Europe
Lee	KA	13 Coy RCEME
Legg	FG	2 Fd Wksp RCEME Camp Petawawa
Leon	GR	1 Fd Wksp RCEME Calgary
Lindsay	GA	7 Coy RCEME
Little	JE	202 Base Wksp RCEME
Low	GA	202 Base Wksp RCEME
MacDonald	CW	4 Fd Wksp RCEME Europe
MacLean	CB	CADEE Valcartier Que
MacLellan	EB	202 Base Wksp RCEME
MacLeod	D	DEME
MacPhee	DM	Incr 'C' Fd Wksp Europe
Mahood	NEH	3 RCHA Incr 'A' Europe
Main	T	1 Fd Wksp RCEME Calgary
Mallett	JG	202 Base Wksp RCEME
Marston	CV	HQ RCEME Wescom Edmonton
Mason	J	14 Coy RCEME
Maw	A	204 Base Wksp RCEME
Maxwell	AC	11 Coy RCEME
McBlane	AG	Alta Area 'I' Staff Edmonton
McCaffrey	LE	2 Fd Wksp RCEME Camp Petawawa
McCormack	CB	3 Fd Wksp RCEME Camp Gagetown
McDonell	AF	1 Fd Wksp RCEME Calgary
McDow	KA	AEEE Orleans Ont
McElroy	JC	14 Coy RCEME
McGovern	PMJ	DDD AHQ
McIntyre	WA	56 Cdn Inf Wksp RCEME Middle East
McLeod	HAT	RCEME School
McLeod	LF	HQ RCEME Eascom Halifax
McLeod	MH	DEME
Melvin	GR	4 Fd Wksp RCEME Europe
Milne	HC	202 Base Wksp RCEME
Molnar	LA	DEME
Moore	WE	DEME
Munday	AC	12 Coy RCEME
Myatt	WC	4 Fd Wksp RCEME Europe
Nelson	EC	Cent Ont Area 'I' Staff Oakville
Newberry	RJ	202 Base Wksp RCEME
Nicolson	A	10 Coy RCEME
O'Grady	CL	202 Base Wksp RCEME
Patterson	MP	204 Base Wksp RCEME
Peacock	GG	DEME
Pennie	FM	11 Coy RCEME

Class 2

Perrin	WG	202 Base Wksp RCEME
Phillips	EW	RCEME School
Pineo	MC	11 Coy RCEME
Press	J	AEEE Orleans Ont
Price	EC	3 Fd Wksp RCEME Camp Gagetown
Proud	VS	204 Base Wksp RCEME
Rawling	GW	D Pers RCEME AHQ
Reimer	JJ	13 Coy RCEME
Reynolds	GA	4 Coy RCEME
Rhodes	AP	204 Base Wksp RCEME
Robertson	DW	3 Fd Wksp RCEME Camp Gagetown
Roche	WD	202 Base Wksp RCEME
Rodd	FL	4 RCHA LAD RCEME Camp Petawawa
Russell	MM	13 Coy RCEME
Rutherford	FA	C&D Estb AHQ
Sambrook	JV	DEME
Schleihauf	GH	C&D Estb CAS(W) Wash
Sedger	CA	11 Coy RCEME
Seeley	HR	HQ RCEME Cencom Oakville
Seguin	RH	4 Fd Wksp RCEME Europe
Silzer	J	7 Coy RCEME
Simpson	WG	2 Coy RCEME
Smith	GE	3 Coy RCEME
Smith	GW	13 Coy RCEME
Smith	J	202 Base Wksp RCEME
Smith	LWC	DEME
Smith	NC	DEME

Class 2

Smyth	WC	204 Base Wksp RCEME
Sochasky	CN	C&E Estb CAS(W) Wash
St Germain	NJ	DEME
St Pierre	G	RCEME School
Stever	JD	202 Base Wksp RCEME
Stewart	RH	204 Base Wksp RCEME
Stirton	J	204 Base Wksp RCEME
Storbo	RM	11 Coy RCEME
Stringer	AJ	Man Area 'I' Staff Mil Winnipeg
Szumlanski	J	56 Cdn Inf Wksp RCEME Middle East
Taylor	HE	3 Fd Wksp RCEME Camp Gagetown
Taylor	JF	12 Coy RCEME
Taylor	RT	56 Cdn Inf Wksp RCEME Middle East
Thibaudeau	AE	202 Base Wksp RCEME
Thomas	GA	RCSA Shilo Man
Thomas	R	7 Coy RCEME
Toms	FA	202 Base Wksp RCEME
Walker	J	202 Base Wksp RCEME
Warminton	JW	3 Coy RCEME
Weaver	CR	2 CIBG LAD RCEME Camp Petawawa
Wild	EB	LdSH (RC) LAD RCEME Calgary
Wilson	RR	4 Fd Wksp RCEME Europe
Wood	WJ	2 RCHA LAD RCEME Winnipeg
Woodrow	JA	2 Fd Wksp RCEME Camp Petawawa
Wright	EO	RCEME School
Young	RJ	11 Coy RCEME

ANSWERS TO TRAINING TEST on page 26

QUESTION	ANSWERS	REFERENCE
1	False; Tri-Service Format.	CAMTS 7.3.3.3
2	Yes, subject to the conditions detailed in the reference.	CAO 270-4 para 3d
3	The Director of Organization.	CAMTS 7.2.4 & 7.2.5
4	Yes.	CAMTS 3.5.1 and 3.5.2
5	Date of successful completion of trade test or course.	CAMTS 4.9.1
6	No.	CAMTS 6.1.5
7	Craftsman Wrench must wait for six more months.	CAMTS 6.2.2.3
8	Yes.	CAMTS 6.4.3
9	Yes. Provisional qualification may be granted on completion of an authorized trade test. He must attend the qualifying course on return to Canada.	CAMTS 4.7
10	Yes.	CAMTS 4.4.1

Total your correct answers and find your grading below.

TOTAL CORRECT ANSWERS	GRADING
9 or 10	Excellent - You should be in DEME!
7 or 8	Good - You have a reasonable working knowledge.
5 or 6	Fair - You should study the policy section of CAMTS.
4 or less	Ugh! - What do you propose to do about it?